

CONTRIBUTIONS TO THE FLORA OF TURKEY

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(M.S., 1963).

Rock. Sc. Pl. 1962

TABULA 3575.

RHODOTHAMNUS SESSILIFOLIUS P. H. Davis.

ERICACEAE. Tribus PHYLLODOCEAE.

Rhodothamnus sessilifolius P. H. Davis; species nova, a *R. chamaecisto* (L.) Reichb. foliis obovatis obtusis sessilibus heterociliatis utrimque stomatibus instructis, sepalis apice truncato-obtusis erosis haud mucronatis, pedicellis et calycibus et capsulis brevius glanduloso-pubescentibus distinguitur.

Fruticulus humilis, 10 cm. altus, ramis ad basin decumbentibus stolones gracillimos subterraneos pubescentes squamoso-foliosos emitentibus, ramulis superne rufescentibus glanduloso-pubescentibus, foliis in rosulas terminales confertis. *Folia* obovata, sessilia, integerrima, alterna, sempervirentia, plana, nitida, 7–12 mm. longa, 3–5 mm. lata, utrimque stomatibus et pilis perpaucis praedita, ad marginem pilis multicellularibus glanduloso-capitatis 176–240 μ longis et pilis brevissimis unicellularibus eglandulosis 56–87 μ longis heterociliata, nervo mediano subtus prominente, nervis lateralibus obscuris. *Flores* 1–3, solitarii, in pedicellos ad basin bibracteolatos in axillis foliorum superiorum dispositi. *Pedicelli* 5–10 mm. longi, pilis brevissimis eglandulosis et pilis brevibus glandulosis pubescentes. *Bracteolae* ovato-orbiculares, minute ciliolatae. *Calyx* fere ad basin in lacinias ovatas vel ovato-lanceolatas apice truncato-obtusas erosas haud mucronatas glanduloso-pubescentes (pilis multicellularibus glandulosis et unicellularibus eglandulosis praeditas) fissus, sub fructu persistens. *Corolla* actinomorpha, rotata, decidua, 17–26 mm. lata, lilacino-rosea, tubo brevissimo 2 mm. longo, limbo saltem ad $\frac{4}{5}$ in lobos late ovatos obtusos leviter emarginatos partito. *Stamina* 10, exserta, 8–11 mm. longa, divergentia, antisepala ceteris sublongiora; filamenta basi dilatata, pilosula; antherae 2 mm. longae, atropurpureae, apice fissuris duabus brevissimis porosae. *Stylus* longe exsertus, 9–13 mm. longus, stigmatibus capitato vix lobulato. *Capsula* subglobosa, 4 mm. longa, glanduloso-pubescentibus, septicide dehiscens, valvulis superne bifidis. *Semina* ignota.

TURKEY. Prov. Çoruh (Artvin): Tiryal Dağ above Murgul, 2150 m., ledges of shady igneous cliff with *Potentilla overimiana*: shrub 3–4 in., flowers lilac-pink (corolla rotate), anthers 10, purple, porose; some of the bushes competing (unfavourably) with *Rhacomitrium*: 23 June 1957, Davis & Hedge D.29974 (K, holotype; ANK, BM, E, isotypes).

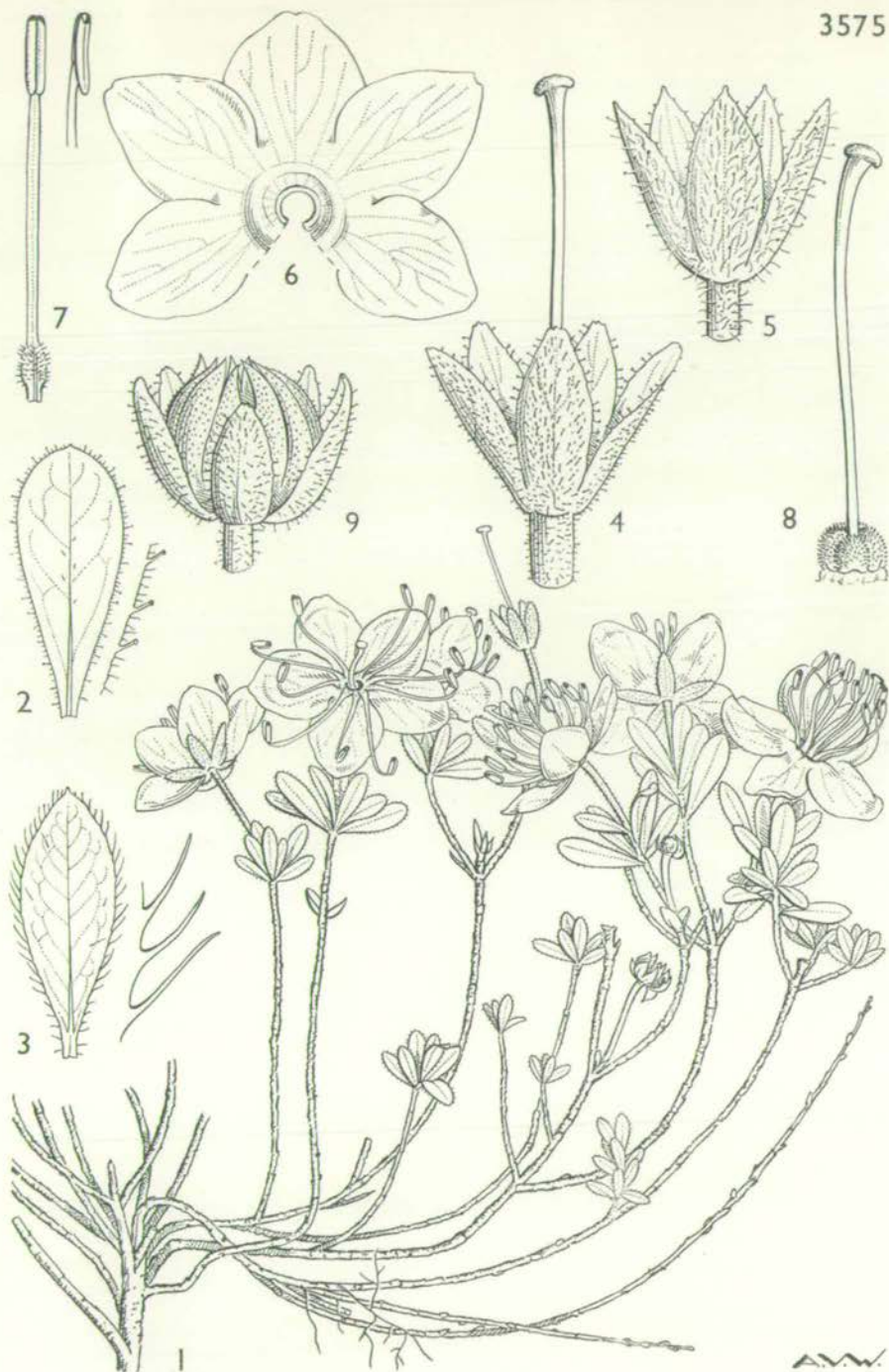
The genus *Rhodothamnus* Reichb. has hitherto been accepted by European botanists as monotypic, containing only *R. chamaecistus* (L.) Reichb. confined to the Eastern Alps. The discovery of a closely related new species in the northeast corner of Turkey, at least 2000 km. from its European relative, is therefore of considerable phytogeographical interest.

Rhodothamnus sessilifolius P. H. Davis differs from the European species in the following diagnostics; leaves obovate, obtuse, sessile (instead of more or less elliptical, acute and shortly petiolate) with a different type of ciliation; the hairs of the leaf-margin are of two types—multicellular glandular-capitate and unicellular eglandular—whereas the ciliation in *R. chamaecistus* is entirely composed of longer and stouter multicellular bristles, only those towards the leaf-apex bearing glands. The leaves of *R. sessilifolius* are thinner (c. 190 μ thick) than in the European species, and bear stomata scattered over both surfaces instead of having them confined to the lower side of the leaf. The sepals are very blunt with an eroded often truncate tip, instead of more or less pointed and subentire with at least the inner ones manifestly mucronate. The glandular indumentum of pedicels, sepals and capsules is shorter than in *R. chamaecistus*, and, on each of these organs, consists of multicellular glandular and much shorter unicellular eglandular hairs. In *R. chamaecistus* the calyx bears only multicellular hairs.

In addition, *R. sessilifolius* forms a less sturdy shrub than its ally; the leaves are crowded into terminal rosettes instead of being scattered along the shoots, and have a very entire (instead of usually serrulate) margin; the pedicels are shorter and the flowers usually smaller; the corolla is deeper coloured than I have seen it in *R. chamaecistus* in the Dolomites. The slender subterranean stolons are poorly developed in the European species. Some of these differences, however, may well be environmentally controlled.

Whereas *R. chamaecistus* is confined to crevices of calcareous rocks (limestone and dolomite), *R. sessilifolius* was found only on a single igneous cliff above the tree line, where it was guarded by a sheep-dog as fierce as Cerberus. The plant shared its crevices with *Potentilla oweriniana* Rupr. ex Boiss.—a species hitherto only known from the Caucasus. *Rhododendron smirnovii* Trautv. and *R. caucasicum* Pallas grew on the neighbouring slopes, and *Orphanidesia gaultherioides* Boiss. et Bal. (a monotypic genus in the *Ericaceae* confined to this area) lower down the mountainside. Old plants of *Rhodothamnus* had their branches covered with *Rhacomitrium canescens* (Hedw.) Brid. and a *Cladonia* sp., suggesting the degeneration phase of cyclical succession.

Recently H. F. Copeland (Amer. Midl. Nat. **30**: 535; 1943; Journ. Arn. Arb. **36**: 82; 1954) has transferred the N.W. American *Kalmiopsis leachianus* (L. F. Henderson) Rehder to *Rhodothamnus*. Though admitting some affinity between the Old and New World species, I cannot follow Copeland in this transfer. *Kalmiopsis* differs strikingly from *Rhodothamnus* in its curious scale-like glands (absent from *Rhodothamnus* and different from any found by Copeland in *Rhododendron* or *Ledum*), broadly campanulate corolla, shorter style, absence of multicellular leaf-ciliation, and in its facies. To combine such dissimilar relicts into one genus seems inadvisable, particularly now that two Old World species of *Rhodothamnus* are known. It seems illogical that Copeland, while splitting *Rhododendron* into 5 genera (largely on the basis of habit and presence or absence of glandular scales) should unite *Rhodothamnus*



Rhodothamnus sessilifolius P. H. Davis

and *Kalmiopsis*. Large size is surely not a good reason for splitting a natural genus. If *Rhododendron* were represented *only* by *R. ponticum* L. and *R. luteum* Sweet (*Azalea pontica* L.), we might indeed be justified in keeping those species in different genera. But the fact that there are numerous connecting links in *Rhododendron* justifies a wider generic concept for *Rhododendron* than for *Rhodothamnus*.—P. H. DAVIS.

Addendum

Since the above account went to press, another gathering of this very rare plant has been received from the same area:—Prov. Artvin: Şavval Tepe above Murgul, 2400 m. alt., on steep moist banks; "corolla pink; only one patch seen"; 6 July 1960, *Stainton & Henderson* 6037 (E).—P. H. DAVIS.

FIG. 1, whole plant, *natural size*; 2, leaf, $\times 3$, and leaf-margin, $\times 8$; 3, leaf of *Rhodothamnus chamaecistus*, $\times 3$, and leaf-margin, $\times 8$; 4, calyx, $\times 4$; 5, calyx of *R. chamaecistus*, $\times 4$; 6, corolla, $\times 2$; 7, stamens, $\times 4$; 8, gynoecium, $\times 4$; 9, fruit, $\times 4$. Figs. 1, 2, 4, 6-9 from *Davis and Hedge* D.29974; 3, 5 from Yugoslavia, Raibl, 30 July 1862, *Churchill* s.n.

ADDITAMENTA AD FLORAM ANATOLIAE. I.

P. H. DAVIS.

This is the first of a series of taxonomic papers dealing with my collections from Asia Minor, and annotates the *Labiatae* gathered on a journey in S.W. Anatolia from July to September, 1947. A general account of the expedition, and a map of the route followed, appeared in J. Roy. Hort. Soc. **74** (3-4) : 1949. I was accompanied on my journey by Kâmil Bilger, Botanical Assistant at the Y.Z.E. in Ankara.

The mountains visited were mainly in Caria, Lycia, Pamphylia and Isauria. But excursions were also made in Galatia (including a visit to the Black Pine forests of Beynam about 30 km. S. of Ankara) and I have cited these Galatian records as many of the summer flowering species are not mentioned by Krause (Ankaranın Floru, 1937). A September visit to Bithynian Olympus, however, has not been included.

Attention is drawn in particular to Tahtali Dağ (ancient Solyma) in Lycia. This mountain had not been previously botanised, and was found to possess an exceptionally rich flora that includes many new species—several of a relict type—due to its favourable position between the main eastern range of the Lycian Taurus and the sea. The area requires further investigation, and is comparable in richness only to such favoured Mediterranean ranges as the Sierra de Cazorla in Spain and the White Mountains of Crete. Of the other mountains I visited in Turkey, Sandras Dağ in Caria and Girdev (Eren) Dağ in Lycia were botanised by Prof. O. Schwarz in 1938, and Geyik Dağ (Gheidagh) in Isauria by Heldreich in 1845. Boz Dağ near Acipayam in Caria has hitherto been virtually unknown botanically, but Baba Dağ (ancient Anticragus) in Lycia was superficially botanised by Forbes in 1842, Bourgeau in 1882, and apparently by Pichler in 1883.

The determination of my gathering should add considerably to our knowledge of this part of Anatolia, and indicate the floral relationships of the area with Greece, the Aegean islands and Cyprus.

No apology, I hope, is required for beginning with the *Labiatae*; being usually left to the last, botanists have not infrequently failed to react in their publications this family which is so richly represented in the area I visited. I am determined that such a fate will not overcome the *Labiatae* on this occasion.

I am indebted to Dr. K. H. Rechinger for determining the species of *Scutellaria*, *Teucrium* Sect. *Chamaedrys* and *Phlomis* Subgen. *Gymnophlomis*, to Dr. K. Ronniger for identifying *Thymus*, and to Prof. O. Schwarz for his collaboration in the naming of certain species. For help and advice I am particularly grateful to Professor Sir William Wright Smith. The taxonomic work was largely undertaken at the Kew and Edinburgh Herbaria with the aid of a grant from The Royal Society. The first set of specimens (including all types) is deposited in the Kew Herbarium.

Genera and species are arranged alphabetically. If a district name (chosen for convenient reference) does not follow the modern province (*vilajet*) name, assume that the district is synonymous with the province. The names of the Roman provinces (used in the sense of Boissier) are

given in brackets. I have endeavoured to follow modern Turkish spelling, with the chief exception of the undotted *i*; mine are all dotted.

LABIATAE. *A. L. Jussieu*, Gen. Pl. 110 (1789).

***Ajuga bombycina* Boiss.**, Fl. Or. 4, 803 (1879).

Prov. Antalya, distr. Alanya (Pamphylia): Alanya, stony calcareous slopes above the harbour, annual or biennial, Aug. 23, 1947, No. 14490.

***A. chia* Schreb. var. *latiloba* Boiss.**, Fl. Or. 4, 803 (1879).

Prov. Muğla, distr. Fethiye (Lycia): Girdev (Eren) Dağ, 2300 m., fl. yellow, Aug. 6, 1947, No. 14490. Prov. Antalya, distr. Alanya (Isauria): Geyik Dağ, 2440 m., perennial, procumbent, not saxatile, leaves green, Aug. 31, 1947, No. 14500; *ibid.*, 2590 m., No. 14545; Ak Dağ (S. of Geyik Dağ) 2300 m., rocky places facing N., procumbent, fl. golden yellow, Aug. 28, 1947, No. 14383.

var. ***suffrutescens* Boiss.**, Fl. Or. 4, 893 (1879).

Prov. Denizli, distr. Acipayam (Caria): Boz Dağ above Geyran Yaylâ, distr. Fethiye (Lycia): Girdev (Eren) Dağ, S. side, 2000 m., in sheltered cultivated hollow, fl. yellow, Aug. 5, 1947, No. 13862. Prov. Antalya, distr. Alanya (Isauria): Geyik Dağ, 2430 m., Aug. 31, 1947, No. 14525.

***Ballota cristata* P. H. Davis**, sp. nov. (Sect. *Beringeria* (Neck.) Benth.).

A. B. rugosa (Russ.) Benth. rhizomate repente, haud rupicolo, indumento dense stellato albo-canescente, folis basi haud cordatis, bracteis lineari-spathulatis duas partes calycis aequantibus, dentibus calycis semper brevissimis, galea corollae albae pilis erectis conspicue niveo-cristata facile distinguenda.

Rhizoma lignescens, breviter repens, ramosum. *Caules* erecti, 15–25 cm. alti, indumento dense stellato canescente (inferne admixtione pilorum simplicium), superne ramosi. *Folia* petiolata; lamina ovata, basi cuneata vel truncata, minutissime crenata, pilis densis stellatis albo-canescens, subrugosa, 1–1.8 (2) cm. longa, 0.7–1.2 (1.5) cm. lata, petiolo 4-plo longior. *Verticillastrae* 7–20-florae foliis floralibus sub-breviora, 1.5–2.5 cm. lata, pedunculis brevissimis. *Bractee* lineari-spathulatae indumento stellato duas partes calycis aequantes. *Calyx* tubulosus, 7–8 mm. longus, stellato-sublepidotus, conspicue 10-costatus, ad medium 2–2.5 mm. latus, superne paulo constrictus, in limbum 1.5–2 mm. longum paulo patens in denticulos decem breviter triangulares mucronatos (quinque longiores ad 1 mm. longos, alternatos vix 0.5 mm. longos) fissum. *Corolla* 1.3–1.4 cm. longa, alba, tubo haud exserto supra medium piloso-annulato; labium inferius valde divaricatum trilobatum lobo mediano profunde bilobulato lobis lateralibus saltem duplo longiore; labium superius quadridentatum pilis longis erectis in pagina superiore cristam 2.5 mm. longam formantibus. *Stamina* posteriora anterioribus paulo breviora. *Nuculae* vix 2 mm. longae, anguste ovatae, subtriquetrae nigro-fuscae, laeves, superne paulo depressae. Floret Aug.

Prov. Antalya (Lycia): Tahtali Dağ (above Kemer), near Çukur Yaylâ, c. 1600 m., in stony calc. soil with *Satureia cuneifolia* and *Origanum minutiflorum*, rootstock creeping, Aug. 15, 1947, Davis 14181 (Typus in Herb. Kew.).

Ballota cristata is a very distinctive new species related to *B. rugosa* (Russ.) Benth. from which it differs by its shortly repent non-saxatile habit, dense stellate indumentum, leaf shape, longer linear-spathulate bracts, and by the conspicuous crest of hairs on the hood of the white (not purplish) corolla.

B. nigra L. subsp. **ruderalis** (Sw.) Briq., Lab. Alp. Mar. 275 (1893).

Prov. Ankara (Galatia) : Beynam, 1200 m., crevices of out-cropping limestone rock in *Quercus* maquis, obviously indigenous, Jul. 7, 1947, No. 13024 ; Hacikadun valley near Kecioren, Jul. 9, 1947, No. 13185a.

subsp. **foetida** (Lam.) Hayek, Prodr. Fl. Balc. 2, 278 (1929).

Prov. Muğla (Caria) : Muğla, on waste ground, fl. mauve, Jul. 20, 1947, No. 13488.

B. pseudodictamnus (L.) Benth., Lab. Gen. et Sp. 594 (1834).

Prov. Muğla, distr. Fethiye (Lycia) : Minara, Jul. 31, 1947, No. 13707. Outside Lycia the species occurs in Crete, Kythera, Antikythera and Cyrenaica.

B. rugosa (Russ.) Benth., Lab. Gen. et Sp. 596 (1834).

Prov. Antalya, distr. Alanya (Pamphylia-Isauria) : between Kizil Kaya Dibi and Kizil Alan, rocks, Aug. 28, 1947, No. 14457.

Calamintha exigua (S. et S.) Hal., Consp. Fl. Gr. 2, 546 (1902).

Prov. Muğla, distr. Fethiye (Lycia) : Girdev (Eren) Dağ, S. side, 2200 m., Aug. 5, 1947, No. 13858.

C. incana (S. et S.) Boiss. ex Benth. in DC., Prodr. 12, 226 (1848).

Prov. Antalya, distr. Alanya (Pamphylia) : Alanya, Aug. 23, 1947, No. 14487.

C. nepeta (L.) Savi, Fl. Pisana, 2, 63 (1798).

Prov. Denizli (Caria) : between Denizli and Taş Ocağı, 900 m. perennial, fl. pale mauve, Jul. 13, 1947, No. 13237.

C. origanifolia (Lab.) Boiss., Fl. Or. 4, 579 (1879) *sensu lato*, incl. *C. floridae* Boiss.

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ, in gravel of dry stream bed in *Pinus nigra* subsp. *pallasiana* zone, fl. pale mauve, Jul. 16, 1947, No. 13404. Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ, 2100 m., N. scree, fl. white, Aug. 16, 1947, No. 14144 ; distr. Alanya (Isauria), Ak Dağ, S. of Geyik Dağ, 2200 m., scree, fl. violet, Aug. 28, 1947, No. 14327, and Ak Dağ W. of Geyik Dağ, 2100 m., near Kara Buynus Yayla, fl. violet, Aug. 31, 1947, No. 14533.

C. origanifolia (Lab.) Boiss. was originally described (under *Clinopodium*) by Labillardière (Ic. Pl. Syr. Rar. 4, 14 : 1812) and based on his material from Lebanon. From the Cilician Taurus Boissier described *C. florida* Boiss. (Diagn. Pl. Or. Ser. I, 12, 51 : 1853), claiming that it differed from *C. origanifolia* in its larger leaves, and corolla with the tube and stamens exerted. *Satureia labillardieri* Briquet (in Annuaire Conserv. & Jard. Bot. Genève, 1898 : 187) was later based on another gathering of Labillardière's from the Lebanon, but this was reduced to a sub-species of

C. origanifolia by Bornmüller (in Beih. Bot. Centr. **31** (2) 248 : 1914) ; he pointed out that the difference in the shape of the calyx teeth was the only constant distinguishing character. Whereas the typical form of *C. origanifolia* is apparently confined to the Central Lebanon (Sannin), subsp. *labillardieri* is found only in the North of the range. In indumentum the group shows considerable variation, in Anatolia as well as in the Lebanon : Boissier described a shaggy variety of *C. origanifolia* (var. *velutina* Boiss., Diagn. Pl. Or. Ser. I. **12**, 51 : 1853—omitted in Boiss., Fl. Or.) from Pisidia, and Bornmüller has based *C. florida* var. *villicaulis* Bornm. (in Fedde, Repert. **49**, 250 : 1940) on a gathering (which I have not seen) from Ala Dag between the Cilician Taurus and Antitaurus. The differences claimed by Boissier (Fl. Or. **4**, 580 : 1879) to distinguish specifically *C. florida* from *C. origanifolia* scarcely hold ; the leaves are variable in size, and the length of corolla and filaments is not necessarily constant in a population—indeed Bornmüller (in Beih. Bot. Centr. **31** (2) 284 : 1914) has already noted that the stamens may be exserted or not in Lebanon material of *C. origanifolia s. lato*. Even if sex forms do not occur, corolla forms certainly do. In all the Cilician material of *C. florida* that I have seen the stamens are long-exserted, but in this respect there is some variation in my two Isaurian gatherings. In their indumentum, however, the latter (No. 13404 and No. 14144) match perfectly the type of *C. origanifolia* var. *velutina* Boiss. from Davros Dag in Pisidia. The indumentum forms in S.W. Anatolia certainly have a geographical basis, but these do not appear to be necessarily correlated with corolla or stamen forms. There is, in fact, such a range of variation in indumentum, number of whorls, length of corolla and filaments, and even in the shape of the calyx, that I believe *C. florida* and *C. labillardieri* must both be included in *C. origanifolia* until the types of the last two (in Herb. Delessert) can be examined and the group studied further in the field.

A peculiar feature of *C. origanifolia s. lato* (incl. *C. florida*) is the inversion of the corolla ; though the calyx remains upright the corolla tube is twisted through 180°, so that the morphologically posterior lip is anterior in position. Unfortunately examination of dried material has not enabled me to decide whether or not the stamens are declinate, as they are in the resupinate flowers of *Salvia jurisicii* ; in the latter, however, it is the pedicel that is twisted. Nabelek's figure of *C. florida* (as *Satureia*) in Publ. Fac. Sc. Univ. Masaryk, Brünn, No. 70, 43 (1926) shows the inversion of the corolla, although it is not remarked on in the text. A study of herbarium material has shown that the same type of inversion characterises the related species *C. nivea* Boiss. and *C. staminea* Boiss. This form of resupination is very unusual, and might be used as a sectional character. A similar flower-shape is characteristic of *Dicliptera* Juss. and *Peristrophe* Nees in *Acanthaceae*.

C. pamphylica Boiss. et Heldr. ex Benth. in DC., Prodr. **12**, 227 (1848).

Prov. Antalya, distr. Alanya (Isauria-Pamphylia) : Kargi Çay, N.E. of Alanya, near place called Taşatan, Aug. 28, 1947, No. 14420 (*fruct.*)—forma haec indumento breviter velutino (haud villosa) a typo differt.

C. troodi Post in Mem. Herb. Boiss. **18**, 97 (1900).

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ above Geyran Yaylâ, 2130 m., limestone scree, fl. violet, Jul. 16, 1947, No. 13381.

Prov. Muğla, distr. Köyceğiz : Sandras Dağ, 2200 m., on serpentine, Jul. 23, 1947, No. 13553 ; *ibid.*, near Gökçe Ova, 1700 m., on serpentine in open *Pinus nigra* subsp. *pallasiana* forest, No. 13499.

This species, related to *C. corsica* Benth. endemic to the mountains of Corsica, has previously only been known from the serpentine peak of Troödos in Cyprus. The Anatolian gatherings differ slightly from Cyprus material in the more prominent nervature on the underside of their usually more pointed leaves, and in their longer calyx teeth. The specimens from the limestone peak of Boz Dağ have longer hairs on the calyces and upper part of the flowering stems than in the Sandras Dağ or Cyprus plants, both of which are found on serpentine. The species is much more abundant on Sandras Dağ than in Cyprus, where the population cannot number more than a few thousand individuals. Nevertheless, the small Cyprus population is not a very homogenous one, particularly in its floral characters : the calyx teeth are sometimes as long as those of the Anatolian plant, and the corolla varies considerably in length (from 13 mm. to 18 mm.)—the latter possibly due to gynodioecism. *C. corsica* shows a similar variation.

Both *C. troodi* and *C. corsica* may well have been derived from the widespread and polymorphic *C. alpina* L. ; Cretan material of the latter species, referred to *C. alpina* L. subsp. *aetnensis* (Strobl.) Rech. fil., Fl. Aegaea, 528 (1943), shows a marked similarity in habit to *C. corsica* and *C. troodi*. *C. alpina* has apparently not been recorded from the Taurus, although it occurs (as var. *anatolica* Bornm.) in Lydia.

C. vulgaris (L.) Druce in Ann. Scot. Nat. Hist. 1906 : 224.

Prov. Ankara (Galatia) : Beynam, 1300 m., by stream, Jul. 5, 1947, No. 13036. Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ, between Çukur Yaylâ and Kuzdere, in *Cedretum*, Aug. 15, 1947, No. 14182.

Calamintha sp. nov. ? (Sect. *Calamintha* Benth.). A *C. betulifolia* Boiss. et Bal. foliis minoribus, bracteis lineari-subulatis, floribus dimidio minoribus, calyce ad $1/3-1/4$ -bilabiato, staminibus anterioribus brevioribus recedit ; a *C. pamphylica* Boiss. et Heldr. indumento brevissime subvelutino, calyce brevioribus ad $1/3-1/4$ -bilabiato, tubo corollae multo brevioribus staminibus anterioribus quam posteriora vix manifeste longioribus differt.

Prov. Antalya, distr. Kemer : Kesme Boğaz near Kemer, 100 m., Aug. 15, 1947, No. 14071. The material is insufficient for a full description.

Dorystaechas hastata Boiss. et Heldr. apud Benth. in DC., Prodr. 12, 261 (1848).

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ near Çukur Yaylâ, 1520 m., rocky slopes, Aug. 15, 1947, No. 14188 ; distr. Antalya (Pisidia), at Termessus, shrub 1 m. tall, Aug. 11, 1947 No. 13948.

Dorystaechas is a monotypic genus known only from this corner of Anatolia and is evidently a relict type.

Lamium cymbalariifolium Boiss. Fl. Or. 4, 759 (1879).

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ, 2200 m., N. scree, Aug. 16, 1947, No. 14170.

L. eriocephalum Benth. in DC., Prodr. 12, 506 (1848).

Prov. Antalya, distr. Alanya (Isauria) : Geyik Dağ, 2500 m., in steep limestone screes on W. side of summit, scarce, fl. pink, Aug. 31, 1947, No. 14566.

L. garganicum L. subsp. **striatum** (S. et S.) Hayek var. **nepetifolium** (Boiss.) P. H. Davis, comb. nov.—*L. striatum* S. et S. var. *nepetifolium* Boiss., Fl. Or. 4, 757 (1879).

Prov. Antalya, distr. Alanya (Isauria) : Ak Dağ (S. of Geyik Dağ) 2300 m., near little lake, fl. pink, Aug. 28, 1947, No. 14385.

Lamium sandrasicum P. H. Davis, sp. nov. (Subgen. *Eulamium* Aschers. Sect. *Pollichia* (Willd.) Briq. Subsect. *Garganica* Briq.).

Affinis *L. cymbalariifolio* Boiss. sed foliis majoribus 9-crenatis ciliolatis textura tenuioribus, galea corollae minus profunde biloba divergit. A *L. microphylo* Boiss. dentibus calycis gracilioribus, forma corollae brevioris recedit.

Caudiculi e base perenne lignescente numerosi subterranei inter lapides serpentinis, in caules fragiles procumbentes, 3–10 cm. longos, 1 mm. latos, foliatis abeuntes. *Folia* parva, petiolata, aliquantum purpurascens; lamina orbiculari-reniformis, cordata, 5–11 mm. lata longitudine paulo brevior, textura tenuis, sparse pubescens margine minute ciliata, crenis brevissime oblongis obtusissimis profunde \pm 9-crenata; petiolus gracillimus lamina 3-plo longior. *Verticillastra* 2–3, biflora, dense capitata. *Bractae* anguste lineares, acutae, calyce subbreves, ciliolatae. *Calyx* conicus, 10–12 mm. longus, glabrescens, ad medium in dentes gracillimos lanceolato-subulatos \pm breviter ciliatos fissus. *Corolla* 2.8 mm. longa, purpureo-rosea, extus hirta, ad tertiam partem bilabiata, tubo exserto; galea in lacinias duas 2 mm. longas irregulariter bifidas divisa; labium inferius lobo mediano 5–7 mm. lato, 4–5 mm. longo, manifeste retuso, lobis lateralibus valde reductis angulatis minute caudatis. *Nuculae* ignotae. Floret Jul.

Prov. Muğla, distr. Köyceğiz (Caria) : Sandras Dağ, 2200 m., rare among serpentine rocks in N. gully below a snow patch, perennial, flowers purplish pink, Jul. 23, 1947, Davis 13548 (Typus in Herb. Kew.).

This very attractive dwarf species differs from the Lycian *L. cymbalariifolium* Boiss. in the size and form of its thinner leaves whose more numerous crenations are shortly oblong and very obtuse; the hood of the corolla is less deeply lobed. Its leaves resemble those of *L. microphyllum* Boiss. (from Cadmus in Caria) but it can be distinguished from that species by its more slender calyx teeth and shorter corolla of different shape.

Lamium sp. nov. ? (Subgen. *Eulamium* Aschers. Sect. *Pollichia* (Willd.) Briq. Subsect. *Garganica* Briq.). A *L. cymbalariifolio* Boiss. foliis majoribus petiolo quam lamina integra vel 3–5-crenata 1–1½-plo longiore, dentibus

calycis brevioribus latioribus differt. A *L. microphylo* Boiss. foliorum crassiorum glabrorum forma dissimili, corolla minore recedit. A *L. sandrasico* P. H. Davis foliorum glabrorum forma et calycibus divergit.

Prov. Muğla, distr. Köyceğiz (Caria) : Sandras Dağ, above Ağla, 1360 m., among serpentine rocks in *Pinus nigra* subsp. *pallasiana* zone, Jul. 25, 1947, No. 13597.

The brief diagnosis refers to an apparently new species collected on the same mountain as *L. sandrasicum* P. H. Davis but at a lower elevation. Unfortunately the limited material is incomplete ; only one withered corolla was available for study. The calyx, in fruit 13 mm. long, is divided to 1/3 into triangular acute (scarcely acuminate) ciliate teeth. The hood of the corolla appears to be deeply bifid.

Lycopus europaeus L., Sp. Pl. 21 (1753).

Prov. Antalya, distr. Elmali (Lycia) : Kara Göl, near Yuva, 1000 m., marshy field, fl. white, Aug. 7, 1947, No. 13913.

Marrubium astracanicum Jacq., Ic. Pl. Rar. 1, 11 (1781-86).

Prov. Konya, distr. Bozkir (Isauria) : near Sau'cak Yaylâ between Geyik Dağ and Bozkir, 2000 m., fl. purple, Sept. 2, 1947, No. 14580.

Marrubium bourgaei Boiss. subsp. **caricum** P. H. Davis, subsp. nov.

A typo caulibus elatioribus, eis turionum sterilium albo-tomentosis, indumento pilis valde inaequaliter stellatis composito, foliis caulinis orbiculari-obovatis superne subsericeis, verticillastris floribusque submajoribus, calycibus et bracteis minus plumosis, dentibus calycis conspicue inaequalibus paulo robustioribus divergit.

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ, c. 2100 m., in calc. scree near the summit, Jul. 16, 1947, Davis 13402 (Typus in Herb. Kew.).

The following forms of *M. bourgaei* Boiss., differing slightly from Boissier's type, have been collected :—

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ, 2100 m., flowers white, Aug. 16, 1947, No. 14195—forma haec floribus minoribus, bracteis et calycibus minus plumosis, dentibus calycis brevioribus a typo paulo differt. Prov. Muğla, distr. Fethiye : Girdev Dağ (Eren Dağ), 2400 m., Aug. 5, 1947, No. 14018—forma haec secunda indumento densiore aureo, foliis valde nervosis bullatis, floralibus brevissime pedunculatis a typo recedit.

The status of subsp. *caricum* is subject to revision, the relationships of these alpine *Marrubia* (Sect. *Marrubium* Benth. Subsect. *Quinquidentata* Briq.) from the Near East being obscure with the material at present available. Local populations appear relatively uniform, but recent gatherings from Anatolia make it increasingly difficult to demarcate some of the species cited by Boissier in *Flora Orientalis*. The related genus *Sideritis* shows a similar complexity of geographical microspecies.

The two Lycian gatherings (14018, 14195) which I have referred to *M. bourgaei* Boiss. (typically a Lycian species but closely related to *M. heterodon* Boiss. et Bal. from Cilicia) differ considerably from the type and evidently represent local races. In the case of No. 14018 it is interesting

to note the variation in length of the calyx teeth (usually considered a good specific character), one form having very unequal slender teeth, and the other much shorter ones, of more or less equal length, recalling those of *M. libanoticum* Boiss. More collecting must be done in Asia Minor before a revision can be satisfactorily undertaken and the relationships of both Balkan and Anatolian forms require careful investigation. *M. bourgaei* subsp. *caricum* certainly shows an affinity with *M. thessalum* Boiss. et Heldr. from Thessalian Olympus.

M. micranthum Boiss. et Heldr. *apud Benth.* in DC., Prodr. **12**, 449 (1848).

Prov. Antalya, distr. Alanya (Isauria) : Ak Dağ (S. of Geyik Dağ) 2300 m., fl. white, Aug. 28, 1947, No. 14370. The dominant plant on the mountainside, growing with *Euphorbia kotschyana* Fenzl.

M. parviflorum Fischer et Meyer, Ind. Petrop. **1**, 33 (1835).

Prov. Ankara (Galatia) : Beynam, in fallow fields.

M. vulgare L. var. *lanata* Benth., Lab. Gen. et Sp. 591 (1834).

Prov. Muğla, distr. Köceğiz (Caria) : Dalaman, Jul. 26, 1947, No. 13570.

Melissa officinalis L. Sp. Pl. 592 (1753).

Prov. Muğla, distr. Köyceğiz : near Ağla on Sandras Dağ, shady banks, Jul. 25, 1947, No. 13585. Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ at Kuzdere, 900 m., plant smelling of ripe apples, fl. creamy yellow, Aug. 15, 1947, No. 14083 & 14087 ; distr. Alanya (Pamphylia—Isauria) : between Kargı Çay and Belister (N.E. of Alanya), 1100 m., on bank of dried-up stream, Aug. 26, 1947, No. 14236.

Mentha—species not yet determined.

Micromeria carica P. H. Davis in Kew Bull. 1948, (4) : 1949.

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ above Geyran Yaylâ, on outcropping limestone rocks in *Pinus nigra* subsp. *pallasiana* forest, fl. mauve, Jul. 16, 1947, No. 13422.

This distinctive species in Sect. *Pseudomelissa* Benth. is related to *M. taygetea* P. H. Davis from the Peloponnesus.

Micromeria carminea P. H. Davis, sp. nov. (Sect. *Piperella* Benth.)

A *M. graeca* (L.) Benth. sensu lato caulibus valde abbreviatis internodiis quam folia multo brevioribus, verticillastris approximatis, tubo calycis longiori removitur. A *M. elliptica* (C. Koch) Boiss. statura nana, indumento breviter tomentoso, foliis valde approximatis, cymis in racemos compactiores dispositis, dentibus calycis gracilioribus lanceolato-subulatis manifeste ciliatis divergit. A *M. croatica* (Pers.) Schott caulibus pumilis foliis lanceolato-ellipticis breviter tomentosis margine revolutis, calyce ad 1/4–1/3 in dentes breviores fisso recedit.

Planta perennis, humilis, saxatilis. *Caules* e base lignoso tortuoso numerosi, ascendentes, 4–6 cm. alti, 0.5 mm. lati, breviter hirsuti, superne crebre foliati. *Folia* lanceolato-elliptica, subsessilia, margine revoluta, pilis subadpressis breviter tomentosa, canescentia, 5–9 mm. longa, 1.5–2.5 mm. lata, valde approximata, internodiis multo longiora,

nervo mediano subtus prominenti, inferiora diminuta, infima decidua. *Cymae* 1-3-florae in axillas foliorum summorum dispositae, breviter pedunculatae, racemum densum, 1-2 cm. longum, 1-1.3 cm. latum, formantes. *Bracteae* angustissime lanceolatae, 1.5-2 mm. longae, pedicellis saepe paulo breviores. *Calyx* tubulosus, 5 mm. longus, tubo 1 mm. lato, breviter piloso-hirsutus, sub-bilabiatus, fauce albo-barbatulus, ad tertiam vel quartam partem in dentes lanceolato-subulatos manifeste ciliatos fissus; dentes inferiores bini, 2 mm. longi, superioribus tribus tenuioribus paulo longiores. *Corolla* 10-11 mm. longa, carminea, tubo exserto superne dilatato piloso; labium superius 3.5 mm. longum, 2.5 mm. latum, obtusissimum, retusum; labium inferius 5 mm. longum et latum, in lobos laterales obtusissimos et lobum medianum orbicularem paulo longius trifidum. *Stamina* posteriora 1.25 mm. longa, anteriora 2.75 mm. longa, lobis antherarum valde divergentibus. *Stylus* 19-20 mm. longus, in ramos vix 1 mm. longos divisus. *Nuculae* ignotae. Floret Jul.

Prov. Denizli, distr. Acipayam (Caria): Boz Dağ above Geyran Yaylâ, 1800-1900 m., in crevices of limestone rocks with *Globularia dumulosa*, flowers almost pure carmine, Jul. 16, 1947, Davis 13403 (Typus in Herb. Kew.).

I have not been able to decide on a precise affinity for this attractive new species. From the polymorphic *M. graeca* (L.) Benth. *sensu lato* it can be distinguished by its very short stems, crowded overlapping leaves, close whorls, and calyces which have, relative to the length of their teeth, a longer tube; in its grey canescent indumentum it approaches *M. graeca* var. *villicaulis* Borb., but in its large flowers it resembles var. *longiflora* Guss. (*Satureia consentina* Ten.) which may have the lower calyx teeth longer than the upper ones—a feature of *M. carminea*. The new species also shows affinities with the N. Balkan *M. croatica* (Pers.) Schott, and with *M. elliptica* (C. Koch) Boiss. from Turkish Armenia.

M. carminea is a local species on Carian Boz Dağ, growing in crevices of limestone rock near the upper limit of the *Pinus nigra* subsp. *pallasiana* forest; it often accompanies *Globularia dumulosa* O. Schwarz—a relict species related to *G. stygia* Orph. from the Styx gorge in the Peloponnesus.

M. cristata (Hoppe) Gris., Spic. Fl. Rum. et Bithyn. 2, 122 (1844).

Prov. Muğla, distr. Fethiye (Lycia): Girdev (Eren) Dağ above Duğer, 1600 m., in crevices of shady limestone rocks sloping at 50°-70°, fl. very pale mauve with darker spots on lower lip, Aug. 6, 1947, No. 13813.

M. graeca (L.) Benth., Lab. Gen. et Sp. 373 (1834).

Prov. Antalya, distr. Kemer (Lycia): Kesme Boğaz near Kemer, 60 m., Aug. 15, 1947, No. 14070.

M. juliana (L.) Benth., Lab. Gen. et Sp. 373 (1834).

Prov. Antalya, distr. Elmali (Lycia): Yuva, 1100 m., rocky S. slope, fl. mauve, Aug. 7, 1947, No. 13728.

var. **myrtifolia** (Boiss. et Hohen.) Boiss., Fl. Or. 4, 570 (1879).

Prov. Antalya, distr. Alanya (Pamphylia-Isauria): Kargı Çay near Kozlu Dere (N.E. of Alanya) 1000 m., Aug. 26, 1947, No. 14275.

M. juliana and its allies certainly require thorough revision; intermediates occur between *M. juliana* var. *myrtifolia* (*M. myrtifolia* Boiss. et Hohen.) and the type, and even *M. graeca* is frequently hard to separate from *M. juliana* as delimited by Bentham (*l.c.*).

Nepeta cadmea Boiss., Diagn. Pl. Or. Ser. I, 5, 63 (1844).

Prov. Denizli, distr. Acipayam (Caria): Boz Dağ near Geyran Yaylâ, in *Pinus nigra* subsp. *pallasiana* forest, fl. white, Jul. 16, 1947, No. 13335.

I very much doubt if *N. cadmea* should be kept specifically distinct from *N. italica* L. Intermediates occur between these two plants, and also, in the Cilician Taurus and Aintab region, between *N. italica* and *N. leucostegia* Boiss. et Heldr. Nevertheless, reduction of *N. cadmea* and *N. leucostegia* to subspecific rank is not advisable until the Balkan species related to *N. italica* have been further studied.

The following gathering is intermediate between *N. cadmea* and *N. italica*:—Prov. Denizli (Caria): Taş Ocağı near Denizli, 600 m., fl. white, Jul. 13, 1947, No. 13257.

N. cataria L., Sp. Pl. 570 (1753).

Prov. Ankara (Galatia): Hacikadun valley near Kecioren, perennial, fl. white, Jul. 9, 1947, No. 13181.

N. cilicia Boiss. ex Benth. in DC., Prodr. 12, 388 (1848).

Prov. Denizli, distr. Acipayam: Boz Dağ above Geyran Yaylâ, 1500–1670 m., in zone of *Pinus nigra* subsp. *pallasiana*, Jul. 16, 1947, No. 13420; *ibid.*, 13436; *ibid.*, 13392. Flowers violet, nutlets tuberculate.

Although Boissier and later authors have taken up the name *N. cilicica*, the species was originally described as *N. cilicia*, so that the latter epithet (which is not orthographically incorrect) should be retained.

N. concolor Boiss. et Heldr. ex Benth. in DC., Prodr. 12, 386 (1848).

Prov. Antalya, distr. Alanya (Isauria): Geyik Dağ, 2590 m., in very exposed rocks on N. side of peak, Aug. 31, 1947, No. 14565; *ibid.*, 2130 m., in rocks on E. side, fl. violet-blue, No. 14554.

The strongly tuberculate nutlets (No. 14554) have a slightly pilose apex; the stems in both gatherings are somewhat scabrid, not smooth as in Heldreich's type from the same mountain.

N. pannonica L., Sp. Pl. 570 (1753) aff. var. **parviflorae** (Benth.) Hayek, Prodr. Fl. Balc. 2, 261 (1929).

Prov. Denizli, distr. Acipayam (Caria): Boz Dağ near Geyran Yaylâ, 1370 m., fl. white, Jul. 16, 1947, No. 13342; *ibid.*, above Geyran Yaylâ, 2280 m., fl. very pale mauve, No. 13416.

Nepeta pilinix P. H. Davis, sp. nov. (Sect. *Eunepeta* Boiss. inter Subsect. *Macrostegias* Boiss. et Subsect. *Stenostegias* Boiss.).

Affinis *N. camphoratae* Boiss. et Heldr. sed foliis vix cordatis, bracteis elliptico-lanceolatis membranaceo-marginatis, dentibus calycis plerumque latioribus, nuculis superne pilosulis recedit. A *N. parnassica* Heldr. et

Sartor foliis vix cordatis, verticillastris remotis, bracteis brevius acuminatis, floribus minoribus, dentibus calycis brevioribus, nuculis in parte superiore pilosulis facile distinguenda.

Planta perennis, basi suffrutescens, ligno tortuoso. *Caules* numerosi, erecti, 20–50 cm. alti, 2 mm. lati, simplices vel parce ramosi, quadranguli, pilis patentibus glanduloso-pubescentes, virescentes. *Folia* petiolata, glanduloso-pubescentia, virescentia; lamina ovato-triangularis, basi abrupte truncata vel etiam paulo subcordata, obtuse crenatodentata, 1.5–2.5 cm. longa, 0.8–1.8 cm. lata, petiolo saltem 3–4-plo longior; folia floralia sessilia, summa diminuta bracteiformia. *Verticillastra* 5–10, inferiora valde distantia internodiis 2–5 cm. longis, superiora subapproximata, 1–2 cm. lata, e cymis breviter pedunculatis congestis composita, spicam 15–20 cm. longam interruptam formantia. *Bracteae* elliptico-lanceolatae, anguste membranaceo-marginatae, ciliatae glanduloso-pubescentes, breviter acuminatae, dimidium vel duas partes calycis aequantes. *Calyx* 6–7 mm. longus, 13-nervius, fauce subobliquus nudus, extus breviter glanduloso-pubescentis, ad partem quartam vel tertiam in dentes triangulato-lanceolatos plerumque acuminatos angustissime membranaceo-marginatos vix patentes fissus. *Corolla* 11 mm. longa, albida vel pallidissime lilacina, tubo curvato 6–7 mm. longo e tubo calycis subexserto; labium superius 4.5–5 mm. longum in lobos late ovatos obtusos profunde bifidum; labium inferius 6.5 mm. longum, valde divaricatum, lobo mediano 4 mm. longo, 6 mm. lato, vix bilobato irregulariter crenato purpureo-punctato sinu 1 mm. lato, lobis lateralibus brevibus rotundatis. *Stamina* 4 mm. longa, lobis antherarum divergentibus. *Stylus* 10 mm. longus, in ramos vix 1 mm. longos reflexos bifidus. *Nuculae* ovato-ellipticae, 2 mm. longae, 1 mm. latae, fuscae, minute tuberculatae, superne pilis albis brevissime pilosulae. Floret Aug.–Sept.

Prov. Antalya, distr. Alanya (Isauria): Ak Dağ (S. of Geyik Dağ) above Gozu Buyuk Yaylâ, c. 2400 m., in gullies on N. limestone cliffs, flowers whitish or very pale lilac, Aug. 28, 1947, Davis 14329 (Typus in Herb. Kew); *ibid.*, c. 2300 m., in rocks and scree by little lake on N.W. face of the mountain, Aug. 28, 1947, No. 14379; Geyik Dağ, on N. side of summit, c. 2400 m., on exposed rock-ledge, Aug. 31, 1947, No. 14572 (*forma*).

N. pilinix belongs to that complex of species arbitrarily divided by Boissier (Fl. Or. 4, 638) into subsections *Macrostegiae* and *Stenostegiae* of Sect. *Eunepeta*; these two subsections are distinguished from each other by the width of the bracts—a character which, like the length of those organs, shows considerable intraspecific variation. Despite its relatively broad bracts (as in Subsect. *Macrostegiae*) the new species seems to show the closest affinity with *N. camphorata* Boiss. et Heldr. (endemic to Taygetus in the Peloponnesus) in Subsect. *Stenostegiae*. *N. camphorata* Boiss. et Heldr. is closely related to *N. heldreichii* (also from Taygetus), *N. spruneri* Boiss. and *N. parnassica* Heldr. et Sart., all Balkan plants in the same subsection. *N. pilinix* also show affinities with *N. leucostegia* Boiss. et Heldr. (from Anatolia and Syria) placed by Boissier (*l.c.*) at the end of Subsect. *Macrostegiae*; it is easily distinguished from that plant by its glandular pubescence, shorter bracts with narrower membranous margins, shorter calyx teeth, and hairy nutlets—like those of *N. pannonica* L. The specific name refers to the latter feature.

I have not seen specimens of *N. isaurica* Boiss. et Heldr., discovered by Heldreich at lower elevations on Gheidagh (Geyik Dağ) than those favoured by *N. pilinux*, but the former seems well distinguished from the new species by its dwarf habit, very shortly velutinous indumentum, small leaves, and linear-subulate bracts.

The Geyik Dağ gathering of *N. pilinux* (No. 14572) differs from the Ak Dağ material in its lower stature, very shortly petiolate leaves of thicker texture, and shorter calyx teeth and bracts; it was growing in a very exposed place and had evidently been grazed. The description covers all the material collected.

Nepeta sp. nov. (Sect. *Eunepeta* Boiss. Subsect. *Stenostegiae* Boiss.).

Prov. Antalya, distr. Kemer (Lycia); Kesme Boğaz near Kemer, 60–100 m., rocky slope, Aug. 14, 1947, No. 14052 (*fruct.*). The plant is being cultivated before a description is drawn up.

Origanum L., Gen. Pl. ed. 5, 256 (1754).

I cannot follow Briquet (in Engler & Prantl, *Pflanzenf.* 4, (3a) 304–309: 1897) in considering *Majorana* Moench and *Amaracus* Gled. as genera distinct from *Origanum* L. Briquet's main reasons for separating *Amaracus* were that in this group the stamens are stated to ascend under the upper corolla-lip (instead of stretching straight out as they do in *Origanum sensu stricto* and *Majorana*) and the calyx is 2-lipped (instead of regularly 5-toothed as in *Origanum s. stricto*). Owing to this staminal character Briquet placed *Amaracus* in Tribus *Stachyoidea* Subtribus *Melissinae*, and *Origanum s. stricto* and *Majorana* in Subtribus *Thyminae*. In so doing he was consistent within his scheme of Labiate classification; but over-emphasis on andraecial and calycine differences has led to an unnatural generic separation of the three groups; the similarities between them were not given due weight. I very much doubt if the stamens do in all cases ascend under the upper lip of the corolla in *Amaracus*; it can hardly be the case in *O. (Amaracus) amanum* Post in which the anthers are practically sessile, and in *O. (Amaracus) wetteri* Barbey et Briq. and *O. (Amaracus) lirium* Heldr. the stamens appear to stick straight out. The specific nature of the latter plant, however, is perhaps open to question (*vide infra*). Although species of *Amaracus* are usually distinguished from *Origanum s. stricto* by a rather characteristic facies, *O. (Amaracus) leptocladus* Boiss. is remarkably similar in habit to *O. laevigatum* Boiss.

Majorana, however, has neither facies nor andraecial distinction to separate it from *Origanum s. stricto*, the only significant difference being in the calyx; the latter has an oblique throat in *Majorana* and, when split to the base anteriorly, has an entire upper lip. In *O. (Majorana) micrantha* Vogel and its allies, however, the calyx is 2-lipped, the upper lip being 3-toothed and the lower bifid. There is in fact such a diversity of calyx shape found in *Majorana*, paralleled by scarcely less in *Amaracus*, that one cannot give calycine differences much importance as generic criteria here.

When Briquet wrote his revision (*l.c.*) only one putative hybrid between the groups in *Origanum s. lato* was known—*O. (Amaracus) lirium* Heldr. from Euboea, believed to be a hybrid between *O. heracleoticum* L.

and *O. scabrum* Boiss. et Heldr. subsp. *pulchrum* (Boiss. et Heldr.) Davis.* Dr. K. H. Rechinger has collected this plant in its *locus classicus* and is certain that it represents a "good" species (Rech. fil., Fl. Aegaea, 531: 1943). I have, however, collected on Taygetus a plant that is certainly conspecific with the Euboean *O. lirium*; it was growing with *O. scabrum* Boiss. et Heldr. subsp. *eu-scabrum* (Hayek) Davis†, and in the field I believed it to be a hybrid between the latter and *O. heracleoticum*. Taygetus and Euboea are the only localities where *O. scabrum s. lato* is found, the two geographically isolated subspecies being morphologically very close to one another (see A. K. Jackson in Hook. Ic. Pl. 34, t. 3302: 1936). It therefore seems probable that, even if *O. lirium* is not a true hybrid between *O. heracleoticum* and *O. scabrum s. lato*, it is a species that has arisen from a hybrid between those two species; it is morphologically intermediate between them. Unfortunately the cytology of the genus—even of our native Marjoram—is apparently uninvestigated.

I list here the six authentic hybrids known between *Origanum s. stricto*, *Amaracus* and *Majorana*, three of which I have collected myself:—

- O. heracleoticum* L. × *O. (Majorana) maru* L. (v.v.)—*Majorana leptoclados* Rech. fil., Neue Beiträge zur Flora von Kreta, 125 (Wien, 1943). Grana pollinis ut videtur abortiva!
- O. ehrenbergii* Boiss. × *O. (Majorana) syriacum* L.—× *O. barbarae* Bornm. in Verh. Zool.-Bot. Ges. Wien, 48, 615 (1898).
- O. laevigatum* Boiss. × *O. (Majorana) syriacum* L.—× *O. symeonis* Mouterde in Ann. Fac. Médec. Beyrouth, 6, (reimp.) 3 (1935).
- O. majorana* L. (*Majorana hortensis*) ♀ × *O. vulgare* L. ♂—× *Origanomajorana applii* Domin in Preslia, 13-15, 197 (1935).—× *Origanum applii* Boros in Bot. Köz. 35, 317 (1938). Hybr. hortensis fertilis.
- O. (Amaracus) sipyleum* L. × *O. (Majorana) onites* L. (v.v.)—× *O. intermediæ* /wm P. H. Davis (vide infra). Grana pollinis abortiva!
- O. (Amaracus) libanoticum* Boiss. × *O. (Majorana) syriacæ* L. (v.v.)‡— /wm × *O. adonidis* Mouterde in Ann. Fac. Franc. Médec. Beyrouth, 6, (reimp.) 4, (1935).—× *Majoranamaracus zernyi* Rech. fil. in Fedde, Rept., 45, 95 (1938). Stamina absunt!

The above list consists of four hybrids between *Origanum s. stricto* and *Majorana*, and two between *Amaracus* and *Majorana*. Unless *O. lirium* be one, there is no hybrid known between *Origanum s. stricto* and *Amaracus*, although in facies certain species in these two groups resemble one another more closely than *Majorana* resembles *Amaracus*. The garden hybrid between *O. vulgare* L. and *O. majorana* L. (*Majorana hortensis*) is certainly fertile—F₂ segregation has been described by Appl in Preslia 6, 3,

***Origanum scabrum** Boiss. et Heldr. subsp. **pulchrum** (Boiss. et Heldr.) Davis, comb. nov.—*O. pulchrum* Boiss. et Heldr. in Boiss., Diagn. Pl. Or. Ser. II, 4, 11 (1859).—*Amaracus scaber* (Boiss. et Heldr.) Briq. subsp. *pulchrum* (Boiss. et Heldr.) Hayek, Prodr. Fl. Balc. 2, 332 (1929).

†**Origanum scabrum**, Boiss. et Heldr. in Boiss., Diagn. Pl. Or. Ser. I, 7, 48 (1846) subsp. **eu-scabrum** (Hayek) Davis, comb. nov.—*Amaracus scaber* (Boiss. et Heldr.) Briq. subsp. *eu-scaber* Hayek, Prodr. Fl. Balc. 2, 332 (1929).

‡In my specimens of this hybrid the calyx is divided to the middle into two unequal lips, the upper having three broadly ovate ciliate teeth shorter than those of *O. (Amaracus) libanoticum*. Stamens are entirely absent.

(1928). The calyces of these two species (the second has never been found wild) are as widely different as one can find in *Origanum s. lato*, so that the occurrence of this fertile hybrid is of particular interest. There is no reliable evidence that any of the other authentic hybrids are fertile; nevertheless, Mouterde (*l.c.*) states that $\times O. barbarae$ and $\times O. symeonis$ are locally abundant. Only one wild hybrid is known between species in any one of the three groups— $\times O. font-queri$ Pau (*O. compactum* Benth. $\times O. grossii$ Pau). *O. (Amaracus) hybridum* Miller, however, is most probably a spontaneous garden hybrid between *O. (Amaracus) dictamnus* L. and *O. (Amaracus) siphyleum* L. (see N. E. Brown in Gard. Chron. Ser III, 3, 232: 1888); it is a vigorous plant, but apparently sterile, being propagated in cultivation by cuttings and division.

If the three groups were to be treated as separate genera we should be faced with at least six inter-generic hybrids (one of which is certainly fertile) and probably only two inter-specific ones. How much importance should be given to such hybridisation as a generic or specific criterion is debatable, but there can be no doubt that the existence of these hybrids indicates a very close relationship between the three groups and, in view of the strong morphological similarities between them, I consider generic separation unjustified. Taken together, they form a very natural group.

Intergeneric hybrids, it should be mentioned, are very rare in *Labiatae*—Briquet (*l.c.*) cites only *Ramona stachyoides* \times *Salvia columbariae*.

Boissier's classification of *Origanum s. lato* (Boiss., Fl. Or. 4, 546: 1879) seems the most natural so far attempted, but I consider it doubtful whether equal sectional rank should be accorded to *Amaracus*, *Origanum s. stricto* and *Majorana*. The last two groups, despite calyx differences, resemble one another more closely than *Amaracus* resembles *Origanum* or *Majorana*.

The "parallel development" between *Origanum* Sect. *Amaracus* and *Thymus* Sect. *Pseudothymbra* is interesting; both possess enlarged coloured bracts and an elongated corolla tube. Although purple is the usual colour that suffuses the bracts in both genera, white-bracted species also occur. A hybrid (\times *Thymus paradoxus* Rouy) is known between species in *Thymus* Sect. *Pseudothymbra* Benth. and Sect. *Serpyllum* Benth. Subsect. *Vulgares* Briq.

***Origanum bilgeri* P. H. Davis, sp. nov.** (Sect. *Majorana* (Moench) Vogel).

Ab *O. micrantho* Vogel indumento patentiore, foliis amplioribus, spicastris saepe oblongis, floribus majoribus, calyce turbinato-campanulato, labiis aequilongis, dentibus labii anterioris plerumque mucronulatis, tubo corollae graciliore recedit.

Caules e base lignosa contorta erecti, 15–30 cm. alti, 1 mm. lati, pilis patentibus 1 mm. longis tomentosi, prope basin gemmis albo-tomentosis praediti, in parte superiore oblongo-paniculati. *Folia* caulium floriferorum orbiculari-ovata, obtusa, brevipetiolata, 1.2–2 cm. longa, 0.8–1.3 cm. lata, glandulis sessilibus haud conspicuis, pilis subpatentibus griseo-tomentosa, superiora subsessilia diminuta. *Spicastra* suboblonga, 0.5–1.5 cm. longa, 0.4 cm. lata, densa vel subinterrupta, in ramulos

corymboso-ramosos in axillis foliorum superiorum disposita. *Bracteae* obovatae, \pm adpressae, calyces suboccultantes, inferiores calycibus paulo longiores, superiores sub-breviores, tomentosulae, ciliatae. Flores gynodioici. *Calyx* 3 mm. longus, turbinato-campanulatus, ad quadrantem bilabiatus, extus hirsutus, ore albo-villosus; labia aequilonga, superius prope ad medium in dentes breviter triangulares trifidum, inferius ad basin in dentes triangulares plerumque mucronulatos bifidum. *Corolla* in floribus ♀ 3.5 mm. longa, in ♂ ad 6 mm. longa, tubuloso-infundibularis, alba, hirtula, tubo vix vel paulo exserto; labium inferius superiore emarginato sublongius. *Stamina* inclusa. *Nuculae* late obovatae, laeves, apice obtusissimae, basi acutiusculae. Floret Aug.-Sept.

Prov. Antalya, distr. Alanya (Isauria): Han Boğaz forest near Geyik Dağ, c. 1500 m., in open *Cedretum* on S. side of dry river-bed, flowers white, Aug. 30, 1947, Davis, 14720 (Typus in Herb. Kew).

O. bilgeri is undoubtedly closely related to *O. micranthum* Vogel from the Cilician Taurus, from which it can be distinguished by its spreading indumentum, broader leaves, frequently oblong spikes and larger flowers; the calyx is turbinate-campanulate with lips of equal length, the teeth of the lower being somewhat mucronate; the corolla tube is more slender than that of *O. micranthum*. There can be no doubt that the latter species, together with *O. bilgeri* and *O. minutiflorum*, constitutes a link between Sect. *Majorana* and Sect. *Eu-Origanum*. The three species are gynodioecious.

I have named the new Isaurian plant after my friend and botanical assistant in Turkey, Kâmil Bilger of the Y.Z.E., Ankara.

O. heracleoticum L., Sp. Pl. 589 (1753).

Prov. Denizli (Caria): between Denizli and Taş Ocağı, 900 m., fl. whitish, Jul. 13, 1947, No. 13230. Prov. Muğla, distr. Köyceğiz: Sandras Dağ, at Ağla, 600 m., dry banks, Jul. 25, 1947, No. 13589; *ibid.*, near Köklüce, 1520 m., Jul. 23, 1947, No. 13636.

Origanum hypericifolium Schwarz et P. H. Davis, sp. nov. (Sect. *Amaracus* (Gled.) Benth. emend. Boiss.).

Species affinis *O. sipyleo* L. sed foliis turionum sterilium haud sericeis foliis caulium floriferorum conspicue glanduloso-punctatis superne vix glaucis margine scabris, caulibus haud eximie paniculatis, bracteis acuminatis recedit. Ab *O. libanotico* Boiss. foliis \pm acutis, bracteis gracilioribus, calyce dentibus labii superioris triangularibus lanceolatis discrepat.

Caules e base lignescente numerosi, erecti, graciles, c. 40 cm. alti, in parte superiore glabri subpaniculati, inferiore hirtuli. *Folia* manifeste glanduloso-punctata, ovata, plerumque \pm acuta, breviter petiolata ea turionum sterilium juvenilium scabro-hirsuta, ea caulium floriferorum (margine scabro excluso) glabra, ad 1.5 cm. longa et 1 cm. lata, superne virescentia, inferne glaucescentia. *Spicae* 5-11, pauciflorae, orbiculari-ovatae, 1-1.5 cm. longae, singulae in pedunculis binis 0.5-2 cm. longis saepe \pm secundis reflexis in axillis foliorum summorum remote dispositae. *Bracteae* orbiculari-ellipticae, acuminatae, glabrae, ad 9 mm. longae et

6 mm. latae, purpurascens. *Calyx* 5–6 mm. longus, glabrescens, glanduloso punctatus, fauce annulo hirto munitus, ad 2/5-bilabiatus; labium superius ad tertiam partem vel dimidium in dentes tres triangulares vel lanceolatos acutos 0.5–1 mm. longos trifidum; inferius breve ad basin in dentes duos triangulares 0.25–0.75 mm. longos divisum. *Corolla* 9 mm. longa, sparsim pubescens, rosea, tubo haud gibboso, labio superiore quam inferius sublongiore. *Stamina* breviter exserta. *Nux* ignota. Floret Jul.

Prov. Denizli, distr. Acipayam (Caria): Boz Dağ above Geyran Yaylâ, abundant in rocky limestone places in Black Pine forest, flowers pink, Jul. 16, 1947, Davis 13401 (Typus in Herb. Kew.). Prov. Muğla, distr. Köyceğiz (Caria): Sandras Dağ above Ağla, on serpentine, Jul. 25, 1947, Davis, 13599; Pirnasdağ near Pirnasköy, in stony pine woods on calc. soil (*Pinus nigra* subsp. *pallasiana*) c. 1300 m., Aug. 5, 1938, Schwarz 443. Cybiris: near Trimali, Oct. 1842, Forbes.

O. hypericifolium is probably most closely related to *O. siphyleum* L. from S.W. Anatolia. It may be distinguished from that species by its conspicuously glandular-punctate leaves; these have a scabrid margin, and are glaucous only on the under surface. The less numerous spikes do not form a spreading panicle as in *O. siphyleum* L., but are borne in pairs in the axils of the upper leaves; the bracts are acuminate. From *O. libanoticum* Boiss. it differs not only in its more acute leaves and narrower bracts, but also in the shape of the calyx teeth.

***O. majoranoides* Willd., Sp. Pl. 3, 137 (1800).**

Prov. Antalya, distr. Alanya (Pamphylia-Isauria): between Kozlu Dere and Kargı Çay (N.E. of Alanya), 1000 m., Aug. 26, 1947, No. 14247. Indigenous.

Elsewhere the species has been recorded as a wild plant only from Cyprus (Stapf in Bull. Imp. Inst. 11, 50: 1913).

***Origanum minutiflorum* O. Schwarz et P. H. Davis, sp. nov. (Sect. *Majorana* (Moench) Vogel).**

Species affinis *O. micrantho* Vogel sed foliis angustioribus conspicue glanduloso-punctatis virescentibus, bracteis minoribus ovatis calyces haud occultantibus, calycibus (ut bracteis) manifeste glandulosis diversa.

Planta suffruticosa, cortice ramorum longitudinaliter fisso. *Caules* valde numerosi, erecti, 15–20 cm. alti, ad 1 mm. lati, pilis brevibus curvatis aspero-hirsuti, inferne gemmis albo-sericeis praediti, superne subcorymboso-paniculati. *Folia* caulium floriferorum ovata, petiolata, saepe acutiuscula, ad 1 cm. longa et 0.5 cm. lata, pilis brevibus hamatis aspera, glanduloso-punctata, virescentia, superiora diminuta subsessilia. *Spicastra* numerosa, parva, orbiculari-oblonga, 3–10 mm. longa, densa vel subinterrupta, in ramos corymboso-ramulosos in axillis foliorum summorum disposita. *Bractee* (ut folia caulina) ovatae, subpatentes, calyces haud occultantes, superiores calycibus sub-breviores, inferiores paulo longiores. *Flores* gynodioici. *Calyx* breviter turbinatus, vix 2 mm. longus, ore albo-villosus, extus hirsutus glanduloso-punctatus, ad tertiam vel quartam partem bilabiatus; labium superius ad medium brevissime tridentatum, inferius superiore sub-brevius ad basin in denticulos duos late

triangulares obtusiusculos bifidum. *Corolla* alba, minuta, in floribus ♀ 2.5 mm. longa, in ♂ 3.5 mm. longa, infundibularis, hirtula, tubo vix exserto; labium superius emarginatum inferiore paulo brevius. *Stamina* inclusa. *Nux* ignota.

Prov. Antalya, distr. Kemer (Lycia): Tahtali Dağ (ancient Solyma) by Çukur Yayla above Kemer, c. 1000 m., on rocky limestone slopes with *Ballota cristata*, flowers white, Aug. 15, 1947, Davis, 14185 (Typus in Herb. Kew.).

Like *O. bilgeri* Davis, the new species described above is related to *O. micranthum* Vogel. The leaves, however, are narrower, conspicuously glandular-punctate, and much greener than in that species; the bracts are smaller, ovate, and do not hide the glandular calyces.

***O. onites* L.**, Sp. Pl. 590 (1753).

Prov. Denizli (Caria): Taş Ocağı near Denizli, 900 m., fl. white, Jul. 13, 1947, No. 13259. Prov. Muğla, distr. Fethiye (Lycia): Telmessus, rocky places, Jul. 28, 1947, No. 13705.

***Origanum saccatum* P. H. Davis**, sp. nov. (Sect. *Amaracus* (Gled.) Benth. emend. Boiss.).

Species haec facie et foliis ut in *O. scabro* Boiss. et Heldr., sed ab eo bracteis tenuioribus acuminatis, calycis labio superiore ut in *O. tournefortio* Sibth. integro (vel emarginato) et corollae tubo saccato facile distinguenda. Ab *O. solymico* P. H. Davis caulibus paniculatis, bracteis angustioribus, calycis labio superiore integro (vel emarginato), tubo corollae manifeste gibboso valde recedit.

Caules e base lignosa erecti, 40–80 cm. alti, inferne ad 2.5 mm. lati, hirsuti, superne glabri, paniculati. *Folia* turionum sterilius orbicularia, subcordata, brevipetiolata, hirsuta; folia caulium floriferorum sessilia vel subsessilia, late ovata, cordata ± acuta, coriacea, glauca, glanduloso-punctata, 1.5–3.5 cm. longa, 1–2 cm. lata, superficie et margine glabra, superiora diminuta. *Spicae* breviter ovato-oblongae, 1–2 (2.5) cm. longae, in ramulis ramorum binorum in axillis foliorum summorum 1–7-enatae. *Bractee* ellipticae, acuminatae, 0.75–1 cm. longae, 2.5–5 mm. latae, glabrae, purpurascens. *Calyx* 5 mm. longus, calceolatus, glaber, glanduloso-punctatus, fauce annulo hirtulo munitus, prope ad medium bilabiatus; labium superius ovatum integerrimum vel emarginatum, inferius fere obsoletum subretusum. *Corolla* 1 cm. longa (vel paulo ultra) hirtula, rosea, tubo superne breviter saccato. *Stamina* longe exserta. *Nuculae* ignotae. Floret Aug.

Prov. Antalya, distr. Alanya (Pamphylia–Isauria): Kargı Çay near Kozlu Dere (N.E. of Alanya), 1000 m., Aug. 26, 1947, Davis 14276 (Typus in Herb. Kew.); Kargı Çay between Durbanas and Derince Dere, 1000 m., rocky limestone slopes in pine woods, Aug. 24, 1947, No. 14397; between Kızıl Alan and Durbanas (N. of Alanya), Aug. 24, 1947, No. 14439.

O. saccatum holds an interesting systematic position. In its facies and leaf-shape it resembles the Greek *O. scabrum* Boiss. et Heldr. but, apart from its narrower acuminate bracts, it differs widely in its calyx (the upper lip being entire and the lower nearly obsolete) and saccate corolla,

both of which recall those of the Aegean *O. tournefortii* Sibth. The latter species, primarily on account of the entire upper lip of the calyx, constituted, with *O. dictamnus* L., the Sect. *Euamaracus* Briq. of *Amaracus* Gleditsch. *O. saccatum* links Briquet's two sections of *Amaracus*, as it combines the calyx of one with the facies of the other. A parallel reduction in calyx form is found in *O. solymicum* Davis where, although the upper lip retains 3 small teeth, the lower lip is almost obsolete.

***O. sipyleum* L.**, Sp. Pl. 589 (1753).

Prov. Denizli (Caria) : Taş Ocağı near Denizli, 1000 m., rocky slopes, fl. pink, leaves glaucous on both sides, Jul. 13, 1947, No. 13256.

***Origanum solymicum* P. H. Davis**, sp. nov. (Sect. *Amaracus* (Gled.) Benth. emend. Boiss.).

Affinis *O. scabro* Boiss. et Heldr., sed spicis oblongis perpauca, bracteis gracilioribus acuminatis, calycis labio inferiore fere obsolete subretuso discrepat. Ab *O. saccato* P. H. Davis caulibus vix paniculatis, spicis paucis, bracteis latioribus, calycis labio superiore tridentato, tubo corollae vix gibboso valde divergit.

Caules erecti, graciles, 30–50 cm. alti, glabri, simplices. *Folia* turionum sterilius hirsutorum orbicularia, infra purpurascens, margine et nervo mediano ciliata; folia caulium floriferorum orbiculari-ovata, basi cordata, subsessilia, coriacea, glauca, glanduloso-punctata, glabra, margine laeva vel scabra vel etiam subciliata, inferiora ± obtusa ad 2 cm. longa et lata, superiora minora remota. *Spicae* 1–3 (5), oblongae, 1–4 cm. longae, in pedunculos manifeste divaricatos in axillis foliorum summorum dispositae. *Bractee* obovato-ellipticae, acuminatae, glabrae, pallide viridi-purpurascens, 9–12 mm. longae, 5–7 mm. latae. *Calyx* 5–6 mm. longus, prope ad medium bilabiatus; labium superius ad quartam vel tertiam partem in dentes triangulares minus 1 mm. longos trifidus; inferius fere obsolete, subretusum. *Corolla* 12 mm. longa, glabrescens, rosea, tubo exserto superne vix gibboso. *Stamina* longe exserta. *Nuces* 1.25 mm. longae, late ovatae, brunneae, obtusissimae. Floret Jul.–Aug.

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ (ancient Solyma) between Kuzdere and Kesme Boğaz, in rocky calc. *Pinetum brutiae*, flowers pink, Aug. 15, 1947, Davis 14078 (Typus in Herb. Kew.); Kesme Boğaz near Kemer, 60 m., in river bed (young plants in a sheltered position), Aug. 17, 1947, No. 14099.

O. solymicum differs from the Greek *O. scabrum* Boiss. et Heldr. by its simple or much less branched inflorescence, oblong spikes, more slender acuminate bracts, and by the almost obsolete teeth of the lower calyx lip. From *O. saccatum* P. H. Davis it is readily distinguished by its simpler inflorescence, broader bracts, tridentate upper lip of the calyx, and almost sackless corolla tube.

The specific name of the new species refers to the classical name for Tahtali Dağ : Solyma.

***Origanum* (Sect. *Amaracus*) *sipyleum* L. × *O.* (Sect. *Majorana*) *onites* L.—× *O. intermedia* P. H. Davis**, hybr. nov.

Ab *O. sipyleo* L. caulibus hirtulis, foliis hirsutis haud glaucis, margine remote serratis, spicis tenuioribus, bracteis minoribus glanduloso-pubescentibus obtusissimis viridibus, calyce calceolato antice ad medium fisso labio inferiore obsoleto (labio superiore breviter tridentata), corollae labio superiore profunde bilobo differt. Ab *O. onites* L. spicis majoribus binis in axillas foliorum summorum (haud in corymbos) dispositis, bracteis majoribus, calyce antice ad medium fisso fauce piloso-annulato, corolla multo graciliore rosea lobulis tenuioribus discrepat. Grana pollinis abortiva. Floret Jul.

Prov. Denizli (Caria) : Taş Ocağı near Denizli, c. 600 m., one plant growing between the parents, flowers raspberry-pink, Jul. 13, 1947, Davis 13260.

This is the second hybrid recorded between *Origanum* Sect. *Amaracus* and Sect. *Majorana*. The pollen grains are abortive.

Phlomis armeniaca Willd., Sp. Pl. 3, 119 (1800).

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ, 2130 m., limestone scree, herbaceous, Jul. 16, 1947, No. 13371. Prov. Muğla, distr. Köyceğiz (Caria) : Sandras Dağ-at Gökce Ova, 1700 m., on serpentine, Jul. 23, 1947, No. 13518 ; distr. Fethiye (Lycia), Girdev Dağ, Jul. 5, 1947, No. 13840 ; *ibid.*, above Bel Yaylâ, 2200 m., Jul. 6, 1947, No. 13973.—det. Rech. fil.

P. carica Rech. fil. in Oest. Bot. Zeitschr. 89 (4) 273 (1940).

Prov. Denizli (Caria) : between Denizli and Taş Ocağı, 600 m., Jul. 13, 1947, No. 13232.—det. Rech. fil.

P. chimerae de Boissieu in Bul. Soc. Bot. France, 43, 290 (1896).

Prov. Antalya, distr. Kemer : Kesme Boğaz at foot of Tahtali Dağ, 60–100 m., rare by pathside in *Pinetum brutiae*, shrub 1.5–2 m. tall, Aug. 15, 1947, No. 14056.—det. e descript.

As specimens of this species were not seen by Vierhapper when he revised Subsect. *Dendrophlomis* (in Oest. Bot. Zeitschr. 65, 225: 1915), he did not place it in his key. De Boissieu related *P. chimerae* to *P. viscosa* Poiret, but the former, though it belongs to the Mediterranean element, certainly appears to be most nearly related to the Irano-Turanian *P. elliptica* Benth. from S. Persia. *P. chimerae* differs from the Persian plant in its taller habit, bracts with a long mucro, longer calycine teeth, and yellow corolla which has a broadly orbicular (not triangular) lower lip ; the flowers of *P. elliptica* are purple. *P. chimerae* was originally described from Chiralu, S. of Kemer, the specific name referring to the jet of inflammable gas—famous as the *Chimaera* of the ancients—that burns perpetually in that locality. Another gathering (Atbükü, between Antalya and Finike, 10 m., May 7, 1936, Tengwall 535) must also be referred to this little-known and very distinctive Lycian endemic.

P. fruticosa L., Sp. Pl. 584 (1753).

Prov. Antalya, distr. Alanya (Pamphylia) : Alanya, 70 m., Jul. 23, 1947, No. 14491.

P. grandiflora H. S. Thompson in Ann. Bot. (London) 19, 441 (1905).

Prov. Muğla, distr. Fethiye (Lycia) : Baba Dağ at Akbel Yaylâ,

1220 m., shrub 1.3 m. tall, Jul. 30, 1947, No. 13693. Prov. Antalya, distr. Kemer : Tahtali Dağ near Kuzdere, 1000 m., in maquis, Aug. 15, 1947, No. 14205.

P. herba-venti L., Sp. Pl. 586 (1753).

Prov. Ankara (Galatia) : Beynam, 1200 m., fallow fields, Jul. 5, 1947, No. 13003.

P. linearis Boiss. et Bal. subsp. **anticragi** P. H. Davis, subsp. nov.

A typo indumento valde cano, petiolis longioribus, lamina latiore et brevioris basi late cuneata, calycibus breviter plumosis removitur.

Caules humiles, 20–30 (35) cm. alti, inferne 2 mm. crassi, plures, simplices, flexuosi, ascendentes vel erecti, pilis stellatis albidis brevibus appresso-tomentosi. *Folia* ut caules pilis stellatis appresse et breviter tomentosa, supra virescenti-canescencia, subtus pallide canescencia; basalia longe petiolata; lamina anguste oblonga, obscure crenata, 4–5 cm. longa, 1–1.3 cm. lata, obtusa, basi late cuneata, petiolo 4–6 cm. longo sub-brevior; caulina minus breviter petiolata internodiis ± aequilonga, lamina lanceolato-oblonga obtusa basi abrupte cuneata, 3.5–5 cm. longa, petiolo 1.3 cm. longo. *Folia floralia* caulinis simillima sed magis breviter petiolata. Verticillastra 2–4. *Bractae* flaccidae, lineares, 4–8 mm. longae, 1/3–1/2-calycem aequantes. *Calyx* 12–15 mm. longus, ± tubiformis, superne in fructum plerumque paulo constrictus, ob pilos valde inaequaliter stellatos 1–1.5 mm. longos plumoso-tomentosus itaque ambitu oblongo-ovatus; dentes 3–5 mm. longi. subinaequales, e base deltoidea abrupte subulati. *Corolla* 2.5 cm. longa; labium inferius superius 14 mm. longo paulo longius, lobo mediano late obreniforme 12 mm. lato, sinu 5 mm. lato, lobis lateralibus triangularibus apice attenuatis. *Nux* 4–5 mm. longa, 1.5–2 mm. lata, fusca, apice haud pilosa.

Prov. Muğla, distr. Fethiye (Lycia) : Baba Dağ (ancient Anticragus) above Fethiye, 1700 m., Jul. 30, 1947, Davis 13672 (Typus in Herb. Kew.).

Subsp. *anticragi* grows outside the area of *P. linearis* (*typica*) and its var. *plumosa* Boiss. (Diagn. Pl. Or. Ser. II, 4, 46 : 1859), both of which belong to the Irano-Turanian element and are more easterly in their distribution than subsp. *anticragi* which grows in the Mediterranean territory of Lycia. I consider that its different phytogeography, together with the morphological differences cited in the diagnosis—most notably the leaf-shape—entitles the Lycian plant to subspecific rank.

The following gathering of *P. linearis* var. *plumosa* was made in Isauria (Prov. Antalya–Konya) : Kara Dağ (N. of Geyik Dağ), 2100 m., steppe-like hillside, local, Sept. 1, 1947, No. 14669—det. Rech. fil.

Phlomis monocephala P. H. Davis, sp. nov. (Sect. *Euphlomis* Benth. Subsect. *Dendrophlomis* Benth.) inter Ser. *Angustebracteatas* Vierh. et Ser. *Latebracteatas* Vierh.

Affinis *P. lyciae* D. Don sed caulibus gracilioribus, foliis ad basin haud cordatis, verticillastris singulis, bracteis obovato-ellipticis brevioribus, dentibus calycis fere obsolete spinulosis differt. A *P. chrysophylla* Boiss.

habitu gracili, floribus sessilibus, forma foliorum et bractearum facile distinguenda.

Frutex erectus, 1–1.5 m. altus, ramis gracilibus, cortice in senectute longitudinaliter fisso. *Folia* ramulorum sterilium petiolata; lamina oblonga, obtusa, basi cuneata, 2.5–3.5 cm. longa, 7–10 mm. lata, petiolo aliquantum longior, pilis stellatis adpressis dense tomentosa, canescens vel aureocanescens. *Caules* floriferi erecti, gracillimi, 30–40 cm. alti, 2 cm. lati, remotissime paucifoliati (foliis deciduis eis ramulorum sterilium ut videtur similibus) stellato tomentosi. *Bracteae* obovato-ellipticae, acutae, adpressae incurvae dimidium calycis paulo superantes 1–2 mm. latae dorso stellatim tomentosae, margine longe albo-villosae. *Calyx* 1 cm. longus vel paulo ultro, tubulosus, pilis stellatis (praesertim in parte inferiore pilis simplicibus admixtis) villosotomentosus, ore subconstrictus atque barbatus, dentibus parte basali depresso-obcordatis, parte apicali fere obsolete spinulosis, spinulis vix 0.5 mm. longis. *Corolla* ignota. *Nuculae* oblongae, glabrae, 4.5 mm. longae, 1.5 mm. latae.

Prov. Antalya, distr. Alanya (Pamphylia–Isauria): between Kozlu Dere and Kargı Çay (N.E. of Alanya), in rocky calc. woods, 1000 m. Aug. 26, 1947, Davis 14250 (Typus in Herb. Kew.).

Although known only from fruiting material, there can be no doubt of this shrub's specific distinctness. *P. monocephala* differs from *P. lycia* D. Don in its slender habit, leaves cuneate at the base, single whorls, shorter ovate-elliptical bracts, and nearly obsolete calyx teeth. The calyx is like that of *P. chrysophylla*, but the new species differs markedly from the latter in its habit, sessile flowers, and the form of its leaves and bracts. In its facies and leaf-shape the new shrub recalls the Cyprian *P. brevibracteata* Turrill, but the form of the bracts and calyces suggests no close affinity. *P. monocephala* is morphologically intermediate between Ser. *Angustibracteatae* Vierh. and Ser. *Latebracteatae* Vierh. (Vierh. in Oest. Bot. Zeitschr. 65, 213–115: 1915), though its closest relationship is certainly with species in the former group.

***P. nissolii* L.**, Sp. Pl. 585 (1753).

Prov. Denizli, distr. Acipayam (Caria): Acipayam, in fallow chalky field, Jul. 18, 1947, No. 13464—det. Rech. fil.

***P. rigida* Lab.**, Ic. Pl. Syr. Rar. 3, 15 (1809).

Prov. Antalya, distr. Alanya (Isauria): between Gönük Dere and Ak Dağ (S. of Geyik Dağ), Aug. 27, 1947, No. 14302. Prov. Konya, distr. Bozkır (Isauria): S. Karance Dere, between Geyik Dağ and Bozkır, Sept. 1, 1947, No. 14612. A very handsome plant.

***P. samia* L.**, Sp. Pl. 585 (1753).

Prov. Antalya (Pisidia): Termessus, 700–1000 m., herbaceous, 0.3–1 m. tall, fl. greenish with purple spots on lower lip, Aug. 11, 1947, No. 13950; distr. Alanya (Pamphylia–Isauria), between Kargı Çay bridge and Beydam, in *Pinus brutia* woodland, 1100 m., Aug. 26, 1947, No. 14253.

P. viscosa* Poiret** subsp. ***bourgaei (Boiss.) *P. H. Davis*, comb. et stat. nov.—*P. bourgaei* Boiss., Fl. Or. 4, 787 (1879).

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ near Kuzdere, 1000 m., Aug. 15, 1947, No. 14205 ; distr. Alanya (Pamphylia), at Alanya, Aug. 23, 1947, No. 14482.

A specimen in the Kew Herbarium, collected by Forbes at Arsa in Lycia, is intermediate between *P. bourgaei* (originally described from Antalya) and *P. viscosa*. On the strength of this, and because of the variability in length of calyx teeth and width of bracts found in the more Oriental *P. viscosa*, I have reduced *P. bourgaei* to a subspecies of the latter.

Phlomis sp. nov. ? (Sect. *Euphlomis* Benth. Subsect. *Dendrophlomis* Benth. Ser. *Angustebracteatae* Vierh.).

Prov. Muğla, distr. Köyceğiz (Caria) : Sandras Dağ, near Ağla, 600 m., in *Pinus brutia* woods on serpentine, Jul. 25, 1947, No. 13586 (*fruct.*).

Though evidently closely related to *P. viscosa* Poiret, this shrub may well prove specifically distinct, but as no flowering material is available a description is not given here. The leaves are remarkably long and narrow.

Prunella vulgaris L., Sp. Pl. 600 (1753).

Prov. Denizli (Caria) : Taş Ocağı near Denizli, 600 m., by water, fl. mauve, Jul. 13, 1947, No. 13262.

Salvia bourgaeana Barbey in Bull. Soc. Vaud. Sc. Nat. **21**, 96 (1885).

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ, near Geyran Yaylâ, 1370 m., herb 0.6 m. tall, fl. lilac, Jul. 16, 1947, No. 13341 ; *ibid.*, 2130 m., No. 13377. Prov. Muğla, distr. Fethiye (Lycia) : Girdev (Eren) Dağ, S. side, 2200 m., fl. lilac, Aug. 5, 1947, No. 13847—det. e descript.

Barbey describes his plant as "minute tomentosopubescent cinereo-virens". My specimens all have glandular-pubescent stems. Some of the leaves are cordate at the base, as in the N.W. Persian *S. sahendica* Boiss. et Buhse (which shows a wide range in shape and size of leaf) and to which *S. bourgaeana* is certainly very closely related.

S. caespitosa Mont. et Aucher in Ann. Sc. Nat. Bot. Ser. II, **6**, 39 (1836).

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ, 2200 m., on rock outcrops, Aug. 16, 1947, No. 14173 ; *ibid.*, No. 14132.

S. candidissima Vahl, Enum. Pl. **1**, 278 (1804).

Prov. Ankara (Galatia) : between Kayaş and Kibris, fl. white, Jul. 6, 1947.

S. grandiflora Eitinger, Salv. 17, (1777).

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ, near Kuzdere, Aug. 15, 1947, No. 14207.

S. nemorosa L., Sp. Pl. ed. 2, 35 (1762).

Prov. Antalya, Girdev Göl, edge of field, fl. violet, Aug. 4, 1947, No. 13756.

S. potentillifolia Boiss. et Heldr. ex Benth. in DC., Prodr. 12, 270 (1848).

Prov. Antalya, distr. Elmalı (Lycia) : between Bel Yaylâ (on Girdev Dağ) and Yuva Yaylâ, 1700 m., fl. always pale yellow, Aug. 8, 1947, No. 13882.

The species was originally described from Ermenek in Isauria, and was stated to have violet flowers. But from Elmalı in Lycia Bourgeau collected sulphur, blue and bicoloured forms under different numbers (Bourgeau 232, 233, 234) ; the population I found, however, was entirely yellow-flowered.

S. recognita Fischer et Meyer in Ann. Sc. Nat. Bot. Ser. IV, 1, 33 (1854).

Prov. Ankara (Galatia) : Kibris gorge near Kayaş, herbaceous, fl. pink, Jul. 6, 1947, No. 13148.

S. sclarea L., Sp. Pl. 27 (1753).

Prov. Ankara (Galatia) : between Kayaş and Kibris, bracts pink, fl. lavender, Jul. 6, 1947, No. 13126.

S. verticillata L., Sp. Pl. 26 (1753).

Prov. Ankara (Galatia) : hills between Kayaş and Kibris, fl. violet, Jul. 6 1947, No. 13120.

S. virgata Jacq., Hort. Bot. Vindob, 1, 14 (1770).

Prov. Ankara (Galatia) : Beynam, 1200 m., steppe, fl. violet-blue, Jul. 5, 1947, No. 13020—forma haec indumento caulium et verticillastrorum albo-tomentosulo a typo differt ; between Kayaş and Kibris, at edge of cultivation, Jul. 6, 1947, No. 13128—forma typica. Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ, at Kuzdere, 1000 m., edge of field, fl. violet, Aug. 15, 1947, No. 14082—forma haec foliis minus rugulosis et minus crenatis a typo recedit. Prov. Konya (Lycaonia) : between Konya and Kaşanan, railway embankment, fl. violet, Sept. 7, 1947, No. 14771—folia vix rugulosa, subcrenata.

No. 13020 (a plant of steppe communities) is very distinctive on account of its woolly indumentum, that of the stems being almost without glands. It may require at least varietal rank, but more material is needed. A classification which widely separates, on the different curvature of the corolla hood, *S. virgata* Jacq. from *S. verticillata* L., is most unnatural. The curvature varies with the development of the flower, and in the Orient the two species are often very hard to distinguish. Krause (Ankaranın Floru, 1937) records *S. verticillata* (but not *S. virgata*) from the environs of Ankara, but I have seen no material from there that could definitely be referred to the former. The group certainly requires critical revision in the Orient.

Satureia cuneifolia Ten., Prodr. Fl. Nap. 33 (1811).

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ near Geyran Yaylâ, fl. white, Jul. 16, 1947, No. 13333. Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ near Çukur Yaylâ, 1520 m., stony hillside with *Ballota cristata* and *Origanum minutiflorum*, fl. white, rarely very pale mauve, Aug. 15, 1947, No. 14190 ; distr. Alanya (Isauria), Gönük Dere on E. side of

Ak Dağ (S. of Geyik Dağ) 1000 m., rocks, fl. white, Aug. 27, 1947, No. 14293, and Han Boğaz forest near Geyik Dağ, 1520 m., in open *Cedretum*, fl. white, Aug. 30, 1947, No. 14722.

S. spinosa L., Sp. Pl. ed. 2, 795 (1763).

Prov. Muğla, distr. Fethiye (Lycia) : Baba Dağ above Fethiye, 1520–1670 m., in shaly calcareous rocks, fl. white, Jul. 30, 1947, No. 13670.

This interesting species has previously only been recorded from Crete and Samos. The Lycian material matches Cretan gatherings very well.

Scutellaria brevibracteata Stapf in Denkschr. Akad. Wiss. Wien. **50**, 99 (1885).

Prov. Muğla, distr. Fethiye (Lycia) : Baba Dağ (above Fethiye), 1370 m., in screes in *Cedrus* forest, fl. dusky violet, Jul. 30, 1947, No. 13682 ; *ibid.*, 1300 m., No. 13686 ; on the same mountain, between Ovacik and Akbel Yaylâ, fl. purple, Jul. 29, 1947, No. 13716. Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ, near Çukur Yaylâ, 1520 m., rocky slopes, fl. violet, Aug. 15, No. 14189—det. Rech. fil.

S. orientalis L. subsp. **alpina** (Boiss.) O. Schwarz in Fedde, Repert. **36**, 134 (1934).

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ above Geyran Yaylâ, 2130 m., Jul. 16, 1947, No. 13368—det. Rech. fil.

S. subvelutina Rech. fil. in Bot. Archiv, **43**, 31 (1941).

Prov. Ankara (Galatia) : Kibris gorge near Kayaş, Jul. 6, 1947, No. 13143. Prov. Antalya, distr. Alanya (Pamphylia–Isauria) : Kargi Çay (N.E. of Alanya, 1000 m., on scree slope, Aug. 25, 1947, No. 14241 (*forma*) ; *ibid.*, at the place called Taşatan, 900 m., scree, No. 14421 (*forma*) ; Han Boğaz forest (*Abietum*) near Geyik Dağ, 1600 m., Aug. 30, 1947, No. 14702 (f. ad *S. megalaspidem* Rech. fil. accedens)—det. Rech. fil.

Sideritis arguta Boiss. et Heldr. in Boiss., Diagn. Pl. Or. Ser. II, **4**, 32 (1859).

Prov. Antalya, distr. Alanya (Pamphylia–Isauria) : between Kargi Çay and Belister (N.E. of Alanya), 1100 m., fl. pale yellow, Aug. 26, 1947, No. 14234. The determination was very kindly checked for me by Dr. R. Weibel ; he compared this gathering with the type of *S. arguta* collected by Heldreich in the same district.

Boissier (Fl. Or. **4**, 712) made *S. arguta* synonymous with *S. libanotica* Lab., but I agree with Bornmüller (in Magyar Bot. Lap. **31**, 130) in considering it specifically distinct.

Sideritis argyrea P. H. Davis, sp. nov. (Sect. *Empedoclea* (Rafin.) Benth.).

Species pulchre sericea, facie affinis *S. cypricae* Post sed habitu haud saxatili, foliis caulinis oblongo-ovatis basi truncatis distincte petiolatis, verticillastris remotissimis, bracteis manifeste cuspidatis, dentibus calycis lanceolatis acuminato-spinulosis, corolla vix brunneo-notata removitur.

Planta basi suffrutescens, pluricaulis. *Caules* erecti, simplices, haud manifeste quadranguli, 40–100 cm. alti, 1.5 mm. lati, recti, inferne pilis

longis patentibus et pilis breviter glandulosis hirti, superne glanduloso-pubescentes, flavido-virides (vel nunc purpurascetes), internodiis 2-6 cm. longis. *Folia* caulina (inferiora evanescentia) petiolata, manifeste gemmifera, dense adpresso-sericea; lamina oblongo-ovata, basi \pm truncata (vel subcordata), 3-4 cm. longa, 1-1.7 (2) cm. lata, minutissime serrato-crenata; petiolus 2-5 mm. longus. *Verticillastra* 3-10, in spicam valde interruptam internodiis infernis 4-7 cm. longis disposita. *Bracteae* flavido-virescentes, membranaceae, late orbiculares, cuspidate 2-5 mm. longa munitae, imbricatae, glanduloso-hirsutae, \pm ciliatae, calycibus sublongiores, nervis haud valde prominentibus. *Calyx* 8-11 mm. longus, ad dimidium vel duas partes in dentes lanceolatos spinulosos glanduloso-hirsutos haud aequales fissus. *Corolla* citrina, pubescens, 1.5 cm. longa, tubo paulo exserto; labium inferius superiore subbrevis, lobo mediano brevi late orbiculari. *Nuculae* ovatae, 2.5 mm. longae, 1.5 mm. latae, brunneae, nitidae. Floret Jul.-Aug.

Prov. Antalya, distr. Alanya (Pamphylia-Isauria): Kargi Çay (N. of Alanya) between Durbanas and Derince Dere, flowers lemon yellow, Aug. 24, 1948, Davis 14402 (Typus in Herb. Kew.); between Kizil Alan and Durbanas (N. of Alanya), in the zones of *Pinus brutia* and *P. nigra* subsp. *pallasiana*, rocky slopes, Aug. 24, 1948, No. 14438.

This very distinct and attractive new species is apparently most closely related to *S. cypria* Post from the northern range of Cyprus. The latter plant was reduced by Lindberg (Iter Cyprium, 30, in Acta Soc. Sci. Fenn. (Nov. Ser. B) 2 (7): 1946) to a variety of *S. cilicica* Boiss. et Bal. Though certainly closely allied to that species, the reduction is to my mind unjustified, *S. cypria* being exceptionally well distinguished in a genus where lines are often hard to draw. Although approaching *S. cypria* in its habit more closely than *S. cilicica*, *S. argyrea* differs from both in its distinctly stalked, oblong-ovate stem-leaves, and slender acuminate calyx-teeth. From *S. cypria* the new species is further distinguished by the shape of its leaves and bracts, by its very remote whorls, and by its flower colour, the corolla of *S. cypria* being heavily marked with brown. Whereas the Cyprus species is confined to crevices of calcareous cliffs with a southern exposure, *S. argyrea* grows on rocky slopes in Pine woods.

Sideritis brevibracteata P. H. Davis, sp. nov. (Sect. *Empedoclea* (Rafin.) Benth.).

A *S. leptoclada* O. Schwarz et Davis caulibus lanatis paniculatis crassioribus, bractearum breviorum forma, dentibus calycis espinulosis divergit. A *S. lycia* Boiss. et Heldr. caulibus elatioribus ramosis, foliis caulinis \pm auriculatis, verticillastris minoribus, bracteis subreniformibus abrupte et breviter cuspidatis valde imbricatis quam calyces brevioribus, dentibus calycis minoris brevioribus discrepat.

Caules e base suffrutescente erecti, ad 80 cm. alti, araneoso-lanati, paniculati, in parte inferiore 2-2.5 mm. lati. *Folia* turionum steriliunum minuta, late obovata, dense albo-pannosa; folia caulium floriferorum lineari-oblonga, \pm auriculata, araneosa, margine sinuato-crenata, deinde evanescentia, gemmis albis persistentibus. *Verticillastra* 6-15, parva, 1 cm. diametro, in spicas interruptas (internodiis infernis 1.5-3 cm. longis) disposita. *Bracteae* late orbiculares vel subreniformes,

abrupte et breviter cuspidatae, calycibus aliquantum breviores, membranaceae, valde imbricatae conspicue reticulato-nervosae, glanduloso-puberulentae (pilis lanosis \pm deciduis), in senectute flavescetes. *Calyx* 7-8 mm. longus, glanduloso-puberulus, ad quartam vel tertiam partem in dentes lanceolatos subacuminatos fissus. *Corolla* vix 1 cm. longa, flava, pubescens, labio inferiore quam superius sub-breviore. *Nuces* vix 2 mm. longae, brunneae, papilloae.

Prov. Antalya, distr. Alanya (Pamphylia): Alanya, 30 m., rocky limestone slopes above the harbour, with *Phlomis fruticosa* and *P. viscosa* subsp. *bourgaei*, flowers yellow, Aug. 23, 1947, Davis 14493 (Typus in Herb. Kew.).

The gathering on which the description is based was collected late in the season and is therefore not in ideal condition, but I consider that the plant's very distinctive appearance merits its publication as a new species. *S. brevibracteata* is a limestone plant, and is probably most closely related to *S. leptoclada* O. Schwarz et P. H. Davis from serpentine formations; it can be easily distinguished from that species by its lanate indumentum, talled paniced stems, bracts (unusually small for the section) shorter than the calyces, and non-spiny calyx-teeth.

S. erythrantha Boiss. et Heldr. apud Benth. in DC., Prodr. 12, 438 (1848) var. **cedretorum** P. H. Davis, var. nov.

A typo indumento sparsiore, foliis caulinis manifestius nervosis, plerumque angustioribus, dentibus calycis brevioribus, corolla citrina (haud purpurea) lineis tenuibus purpureo-brunneis graciliter notata divergit. Floret Aug.

Prov. Antalya, distr. Alanya (Isauria): Han Boğaz forest near Geyik Dağ, 1520 m., in *Cedretum*, fl. lemon yellow with purlish-brown veining, Aug. 30, 1947, Davis, No. 14723 (Typus in Herb. Kew.).

I have not seen the typical form of this rare species in the field.

S. galatica Bornm. in Magyar Bot. Lap. 31, 135 (1932).

Prov. Ankara (Galatia): Kibris gorge near Kayaş, fl. pale yellow, Jul. 6, 1947, No. 13143.

Sideritis leptoclada O. Schwarz et P. H. Davis, sp. nov. (Sect. *Empedoclea* (Rafin.) Benth.).

A *S. gracili* Barbey caulibus pubescentibus, foliis turionum steriliu bombycinis, caulinis breviter auriculatis, dentibus calycis sub-brevioribus manifeste spinulosis abhorret. A *S. brevibracteata* P. H. Davis caulibus simplicibus gracillimis pubescentibus, bracteis longioribus, forma calycis inter alia facile separanda. Species regionis inferioris serpentine.

Planta basi suffrutescens. *Caules* erecti, gracillimi, rigidi, quadranguli, simplices (si ab animalibus adesi saepe ramosi) 20-60 cm. alti, 1 mm. lati, pilis brevibus glandulosis et longis patentibus pubescentes. *Folia* turionum steriliu parva, obovata, densissime niveo-pannosa; folia caulium floriferorum oblongo-linearum, sessilia, basi breviter auriculata, 1.5-3 cm. longa, 2.5-4 mm. lata, minute serrato-crenata, araneosa. *Verticillastra* 2-5, remota, 1-1.5 cm. lata, spicam interruptam internodiis 2-5 cm. longis formantia. *Bractee* orbiculares, luteo-virides, imbricatae,

pungenti-cuspidatae, calyce paulo longiores, membranaceae, glanduloso-pubescentes, ciliatae. *Calyx* 7–8 mm. longus, glandulosus, ad quartam vel tertiam partem in dentes triangulari-lanceolatos villosos in spinulam brevem lutescentem exeuntes fissus. *Corolla* 9 mm. longa, hirsuta, citrina, tubo haud exserto, labiis aequilongis. *Nuculae* ignotae. Floret Jun.–Jul.

Prov. Muğla, distr. Köyceğiz (Caria) : between Dalaman and Göcek, below 300 m., in open *Pinetum brutiae*, Jul. 26, 1947, Davis, 13566 (Typus in Herb. Kew.) ; Sandras Dağ below Ağla, 300 m., on serpentine in *Pinetum brutiae*, Jul. 25, 1947, Davis 13583 ; near Aliköy, 800 m., Jul. 14, 1938, Schwarz 746.

S. leptoclada, as known at present, is confined to serpentine soils in the *Pinus brutia* forests of S. Caria. In the diagnosis the plant has for convenience been compared with *S. gracilis* Barbey (from higher altitudes on the limestones of Lycia), although it is doubtful whether the latter is specifically distinct from *S. libanotica* Lab. (*vide infra*).

***S. libanotica* Lab.**, Ic. Pl. Syr. 4, 13 (1812) *emend. Bornm. sensu lato, incl. S. gracili* Barbey.

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ above Geyran Yaylâ, 2130 m., Jul. 16, 1947, No. 13380. Prov. Muğla, distr. Fethiye (Lycia) : Baba Dağ, above Akbel Yaylâ, 1370 m., fl. lemon yellow, Jul. 30, 1947, No. 13681 ; *ibid.*, 1520–2130 m., No. 13673 ; *ibid.*, 1520 m., No. 14183. Prov. Antalya, distr. Elmali (Lycia) : Yuva, 1100 m., fl. pale lemon yellow, Aug. 7, 1947, No. 13734 ; distr. Kemer (Lycia), Tahtali Dağ, 2100 m., Aug. 16, 1947, No. 14200 (grazed), and on the same mountain between Çukur Yaylâ and Kuzdere, 1520 m., Aug. 15, 1947, No. 14183.

I have provisionally had to accept a rather wide concept of *S. libanotica* Lab., and prefer not to recognise precise sub-specific units until I have seen Labillardière's type and have studied the plants more thoroughly in the field. Unfortunately *S. libanotica* var. *genuina* Bornm. (in Magyar Bot. Lap. 31, 139 : 1932) is not based on the type of the species, but on Ehrenberg's specimens from Bscherre in Lebanon which differ slightly from Labillardière's original figure and description. From the Cilician Taurus Bornmüller (*l.c.*) recognises two subspecies of *S. libanotica*—subsp. *ambigua* Fenzl (*pro spec.*) ex Bornm. and subsp. *linearis* (Benth.) Bornm.—which seem to me doubtfully distinct from one another though certainly well distinguished from the Lebanese specimens I have seen. Furthermore if the plants from the Cilician Taurus are to be retained in *S. libanotica*, I do not see that the Lycian *S. gracilis* Barbey can be kept as a distinct species. Bornmüller, in fact, has pointed out that this plant (which he cites as a species) may be considered a glabrous form of *S. libanotica* subsp. *ambigua* ; the co-type of *S. gracilis* in Herb. Kew., however, is definitely hairy !

In the Lycian Taurus I made several gatherings belonging to this complex (cited above), none of which can be said to match exactly the co-type of *S. gracilis* ; they show a very considerable range of variation, but the majority resemble *S. libanotica* subsp. *ambigua*. I have therefore tentatively referred all these to *S. libanotica sensu lato*. It is possible, however, that further study may show that the Taurus forms of *S.*

libanotica are specifically distinct from the Lebanon plants ; in that case, if one specific name is required to cover the Anatolian material, *S. gracilis* Barbey has priority. I agree with Bornmüller (*l.c.*) in assigning specific rank to *S. arguta* Boiss. et Heldr.

It should be mentioned that a plant was collected in the Antilebanon (Davis 9972) which differs somewhat from Lebanon material of *S. libanotica* ; in its small bracts it recalls the Irano-Turanian *S. microchlamys* (Handel-Mazzetti) Bornm., a plant originally described as a variety of *S. libanotica*. In the N.E. of Mt. Lebanon (between Hermel and Merj Sh'in) another *Sideritis* was collected (Davis 9870) that may prove specifically distinct ; it has very tall stems, obovate leaves, and relatively close spikes which give it a resemblance to *S. pisidica* Boiss. et Heldr.

***S. montana* L. var. *comosa* Boiss. f. *xanthocoma* Azn.** in Bull. Soc. Bot. France, **44**, 174 (1897).

Prov. Ankara (Galatia) : Hacikadun valley near Ankara, Jul. 9, 1947, No. 13179.

var. ***cryptantha* Boiss.**, Fl. Or. **4**, 707 (1879).

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ, 2280 m., Jul. 16, 1947, No. 13417, fl. lilac *in sicc.*

Hayek (Prodr. Fl. Balc. **2**, 256) ignores var. *cryptantha* on the grounds that it is apparently a cleistogamous form. My specimens, however, match closely a gathering in the Kew Herbarium collected by Heldreich at Bouldour (Burdur) in Pisidia and determined as this variety by Boissier. As No. 13417, whether it is cleistogamous or not, certainly represents a population, I have retained the varietal name.

***S. perfoliata* L.**, Sp. Pl. 575 (1753).

Prov. Antalya, distr. Alanya (Pamphylia) : between Kizil Kaya Dibi and Kizil Alan (N. of Alanya), root smelling of poppies, Aug. 24, 1947, No. 14458.

***S. pisidica* Boiss. et Heldr. *apud* Benth.** in DC., Prodr. **12**, 440 (1848).

Prov. Muğla, distr. Fethiye (Lycia) : Girdev (Eren) Dağ, S. side, 2000 m., Aug. 5, 1947, No. 13830 ; *ibid.*, on rocks, very goat-eaten, Aug. 6, 1947 (no number). Prov. Antalya (Pisidia) : Termessus, above Yenice Khave, 600 m., in *Quercetum*, Aug. 11, 1947, No. 13947.

No. 13830 differs from the co-type in that the lower lip of the corolla is not shorter than the upper one.

***S. remota* Urv.** in Mem. Soc. Linn. Paris, **1**, 322 (1822).

Prov. Denizli, distr. Acipayam (Caria) : Monastir Ormani, between Acipayam and Abbas, open places near dry river bed in *Pinetum brutiae*, Jul. 18, 1947, No. 13469.

***S. stricta* Boiss. et Heldr. *apud* Benth.** in DC., Prodr. **12**, 441 (1848).

Prov. Antalya (Pisidia) : between Termessus and Yenice Khave, in *Quercus* maquis, 460 m., stem simple or 3-branched, Aug. 11, 1947, No. 13940. The species is certainly closely related to *S. perfoliata* L.

Sideritis violascens P. H. Davis, sp. nov. (Sect. *Empedoclea* (Rafin.) Benth.).

Affinis *S. libanoticae* Lab. praesertim subsp. *ambiguae* Fenzl (*pro spec.*) ex Bornm., sed rhizomate lignoso manifeste procumbente, caulibus minus rigidis, foliis turionum sterilium semper obovatis, floribus violascentibus divergit.

Planta gemmis lanatis minutis basi praedita. *Caulis* ascendentes, 20–30 cm. alti, subsimplices, tenues, lanati. *Folia* serrulata crenis mucronulatis ea turionum sterilium obovata in petiolum sensim attenuata, ad 6 cm. longa et 1.2 cm. lata, subflaccida, lanata, juventute grisea, ea caulina pauca, valde remota, obovata, oblonga, superiora subsessilia. *Verticillastra* parva, 2–6, remotissima, 1–1.5 cm. lata, in spicam internodiis 3–6 cm. longis disposita. *Bracteae* late orbiculares, breviter cuspidatae, calyce paulo breviores, vix imbricatae, purpurascens, membranaceae, glandulosae, sublanatae, inconspicue nervosae. *Calyx* 7–9 mm. longus, purpurascens, in toto glanduloso-villosus, ad tertiam partem in dentes triangulari-lanceolatos acutos divisus. *Corolla* 8–10 mm. longa, violascens, hirtula, tubo haud exserto. *Nuculae* ignotae. Floret Aug.

Prov. Konya, distr. Bozkir (Isauria) : S. Karance Dere between Geyik Dağ and Bozkir, 1800 m., flowers violet, Sept. 1, 1947, Davis, 14611 (Typus in Herb. Kew.) ; *ibid.*, No. 14611. Prov. Antalya, distr. Alanya (Isauria) : Geyik Dağ, 2280–2440 m., flowers dusky violet, Aug. 31, 1947, No. 14546.

No. 14646, from Han Boğaz forest near Geyik Dağ, has a more sturdy inflorescence than the numbers quoted above, but probably belongs to the same species ; it has not been included in the description.

I have referred, under *S. libanotica*, to some of the problems in the classification of that polymorphic supraspecies. A tendency to use *S. libanotica* as a dumping ground, however, is to be discouraged, and, though I am still undecided as to the specific limits of *S. libanotica*, I do not believe that *S. violascens* could be included in it. From *S. libanotica* Lab. (*emend.* Bornm. *sensu lato*, incl. *S. gracili* Barbey) it is easy to distinguish *S. violascens* by its habit, the woody base being somewhat repent ; the stems are less rigid, the leaves of the sterile shoots always manifestly obovate, and the colour of the flowers is violet—a colour, so far as is known, occurring elsewhere in Sect. *Empedoclea* only in *S. erythrantha* Boiss. et Heldr. (*typica*). *S. libanotica* appears to be absent from the part of the Taurus where *S. violascens* was found, Heldreich's specimen quoted in Boiss., Fl. Or. 4, 112, being *S. arguta* Boiss. et Heldr. The section is extremely well represented in the district.

Sideritis aff. **condensatae** Boiss. et Heldr. *apud Benth.* in DC., Prodr. 12, 439 (1848).

Prov. Antalya, distr. Alanya (Isauria) : Beydam (near Geyik Dağ), 1000 m., cultivated, Aug. 26, 1947, No. 14249. Fragmentary specimens were brought to me by the villagers of Beydam who cultivate the plant ; they assured me that it had been collected in the mountains nearby. The indumentum is like that of *S. condensata* var. *procumbens* Boiss. et Heldr., but the bracts are larger and prominently veined.

Sideritis aff. **perfoliatae** L., Sp. Pl. 575 (1753).

Prov. Konya, distr. Bozkir (Lycaonia-Isauria) : Bozkir, 1100 m., on chalky steppe hills, Sept. 2, 1947, No. 14583 (*fruct.*). The whorls are all exceedingly distant from one another.

Stachys citrina Boiss. et Heldr. *apud Benth.* in DC., Prodr. **12**, 490 (1848).

Prov. Antalya, distr. Alanya (Isauria) : Geyik Dağ, 2430 m., generally in calc. rocks, perennial, fl. bright lemon yellow with two purple lines on upper lip, Aug. 31, 1947, No. 14510 ; *ibid.*, No. 14574 ; Ak Dağ (S. of Geyik Dağ), 2300 m., in rocks near little lake, Aug. 28, 1947, No. 14346 ; *ibid.*, above Siricek Yaylâ, generally grazed, No. 14330. A beautiful species.

S. cretica L. subsp. **anatolica** Rech. *fil.* in Ann. Nat. Hofmus. Wien, **48**, 175 (1937).

Prov. Ankara (Galatia) : Beynam, 1200 m., in fallow field, Jul. 5, 1947, No. 13001.

S. cretica L. aff. subsp. **mersinaeae** Rech. *fil.* in Ann. Nat. Hofmus. Wien, **48**, 176 (1937).

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ, near Çukur Yaylâ, 1500 m., Aug. 15, 1947, No. 14212 ; *ibid.*, 1460 m., Aug. 17, 1947, No. 14090.

The teeth are more broadly triangular than in typical Cilician material of this subspecies, and only very shortly mucronate.

S. germanica L. aff. subsp. **heldreichii** (Boiss.) Hayek, Prodr. Fl. Balc. **2**, 285 (1929).

Prov. Muğla, distr. Köyceğiz (Caria) : Köyceğiz, by the road, annual ? Jul. 25, 1947, No. 13564.

Teucrium chamaedrys L. subsp. **tauricum** Rech. *fil.* in Bot. Archiv **42**, 376 (1941).

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ, 2200 m., fl. purplish, Aug. 16, 1947, No. 14135—det. Rech. *fil.*

subsp. **sympirensis** (C. Koch) Rech. *fil.* var. **hirsutum** (Čel. in Bot. Centr. **14**, 220 : 1883) Rech. *fil.* in Ann. Nat. Hofmus. Wien **51**, 427 (1941).

Prov. Ankara (Galatia) : Beynam, 1200 m., steppe, fl. purplish-red, Jul. 5, 1947, No. 13013.

f. inter subsp. **tauricum** Rech. *fil.* et subsp. **sympirensis** (C. Koch) Rech. *fil.*

Prov. Muğla, distr. Fethiye (Lycia) : Kara Tepe near Seki Yaylâ, 1640 m., fl. purple, Aug. 3, 1947, No. 13874 ; Girdev (Eren) Dağ, S. side, 2200 m., Aug. 5, 1947. Prov. Antalya, distr. Alanya (Pamphylia-Isauria) : Kargı Çay between Durbanas and Derince Dere (N.E. of Alanya), Aug. 24, 1947, No. 14408.—det. Rech. *fil.*

f. inter subsp. **tauricum** Rech. *fil.* et subsp. **eu-chamaedrys** Rech. *fil.* in Bot. Archiv **42**, 344 (1941).

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ, between Abbas and Geyran Yaylâ, fl. reddish purple, Jul. 16, 1947, No. 13322; *ibid.*, near Geyran Yaylâ, 1370 m., in *Pinus nigra* subsp. *pallasiana* forest, fl. reddish-purple, Jul. 16, 1947, No. 13330.—det. Rech. fil.

T. lamiifolium *Urville* in Mem. Soc. Linn. Paris, **1**, 320 (1822).

Prov. Antalya, distr. Alanya (Isauria) : Han Boğaz forest, near Geyik Dağ, 1520 m., Aug. 30, 1947, No. 14719.

T. montanum *L.* var. **parnassicum** *Čel.* in Bot. Centr. **14**, 153 (1883).

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ, 1820–2130 m., fl. pale yellow, Jul. 16, 1947, No. 13399.

T. montbretii *Benth.* in Ann. Sci. Nat. Bot. Ser. II, **4**, 56 (1836).

Prov. Antalya (Pamphylia) : Antalya, in tufa rocks to the W. of the harbour, scarce, stems appressed to the rocks, very brittle, fl. lilac, Aug. 19, 1947, No. 14217. Boissier (Fl. Or. **4**, 815) cites sterile specimens collected in this locality by Bourgeau. The species has a disjunct distribution in the Levant, Antalya being apparently its most westerly station. Its most southern locality is in Judea, where it grows upside-down on the roofs of dry caverns.

T. orientale *L.*, Sp. Pl. 562 (1753).

Prov. Ankara (Galatia) : between Kayaş and Kibris, steppe hills, fl. lilac-blue, Jul. 6, 1947, No. 13125.

T. polium *L.*, Sp. Pl. 566 (1753) *sensu lato*.

Prov. Ankara (Galatia) : Beynam, 1200 m., steppe, fl. whitish, Jul. 5, 1947, No. 13016; *ibid.*, in *Quercus* zone, No. 13081. Prov. Denizli, distr. Fethiye (Caria) : Boz Dağ, near Geyran Yaylâ, 1370 m., fl. white, Jul. 16, 1947, No. 13332; *ibid.*, between Abbas and Geyran Yaylâ, procumbent, No. 13321. Prov. Muğla, distr. Köyceğiz (Caria) : Sandras Dağ, 2000 m., near Gökce Ova, on serpentine, fl. white, Jul. 23, 1947, No. 13520; *ibid.*, 1520 m., near Köklüce, on serpentine, fl. white, Jul. 22, 1947, No. 13630; distr. Fethiye (Lycia), on Baba Dağ between Ovacik (above Fethiye) and Akbel Yaylâ, 600 m., Jul. 29, 1947, No. 13718, and on Kara Tepe near Seki Yaylâ, 1600 m., fl. white, Aug. 3, 1947, No. 13873.

T. sandrasicum *O. Schwarz* in J. R. Hort. Soc. **74** (3) 115 (1949).

Prov. Muğla, distr. Köyceğiz : Sandras Dağ, 1060–1520 m., on serpentine on open S. slopes in *Pinus nigra* subsp. *pallasiana* forest, fl. lavender-blue, Jul. 22, 1947, No. 13559. The species is related to *T. creticum* *L.* in Sect. *Teucris* *Benth.* Ser. *Integrifoliae* *Briq.*

T. scordioides *Schreb.*, Pl. Vert. Unilab. 37, (1774).

Prov. Denizli (Caria) : Taş Ocağı near Denizli, 600 m., by stream, Jul. 13, 1947, No. 13271. Prov. Muğla, distr. Köyceğiz (Caria) : Sandras Dağ at Köklüce, by stream, Jul. 23, 1947, No. 13601. Prov. Antalya, distr. Elmali (Lycia) : Kara Göl near Yuva, 1000 m., fallow fields, Aug. 7, 1947, No. 13921. Prov. Konya (Lycaonia) : between

Konya and Kayacik, in dryish saline marshes, fl. purplish-pink, Sept. 6, 1947, No. 14738.

Thymbra sintenisii *Bornm. et Aznavour* in Fedde, Repert. **10**, 471 (1912).

Prov. Antalya, distr. Alanya (Pamphylia-Isauria): Kargi Çay, between Durbanas and Derince Dere, rocky slopes, fl. white, Aug. 25, 1947, No. 14464.

This gathering differs from the type in the longer ciliation both of the leaves and somewhat longer bracts, and in the more slender teeth of the upper calyx-lip. As in the type, the calyx is covered with very short crisp hairs.

T. spicata L., Sp. Pl. 569 (1753) (*typica*).

Prov. Antalya, distr. Alanya (Pamphylia): Alanya, Aug. 23, 1947, No. 14486.

var. **intricata** P. H. Davis, var. nov.

A typo ramis floriferis abbreviatis valde divaricato-ramosis fruticem nanum intricatum rigidum formantibus, spicis brevibus, bracteis minoribus parce ciliatis calycibus aequilongis distinguitur.

Prov. Denizli, distr. Acipayam (Caria): Boz Dağ, near Geyran Yaylâ, 1220-1520 m., dominant on dry gravelly slope facing S., fl. purple, Jul. 16, 1947, No. 13328.

Examination of plentiful material of *T. spicata* L., and acquaintance with this species in the field, indicate that the new variety can scarcely be considered a modification of the typical form due to dry conditions or to grazing. *T. spicata* L. frequently grows in drier habitats. In the variety described above, the branches do not appear to ramify in this characteristic manner (the angle of branching being about 80°) after having been nibbled off; nor is the plant flowering out of season. *T. spicata* was not found elsewhere in the Boz Dağ region, but in the locality where var. *intricata* was collected. The latter was the only form seen, being dominant over the hillside; I therefore assume that it has a genetic basis. Nevertheless, specimens intermediate between this variety and the type were collected in W. Lycia (slopes of Baba Dağ, between Fethiye and Ovacik, Jul. 29, 1947, No. 13713); as the plants were growing on a steep shady bank under pines they were probably out of character.

Thymus chaubardii (*Boiss. et Heldr.*) *Čel.* var. **boeticus** (*H. Braun*) *Ronn.* in Hayek, Prodr. Fl. Balc. **2**, 347 (1929).

Prov. Muğla, distr. Köyceğiz (Caria): Sandras Dağ, at Gökce Ova, on serpentine, Jul. 23, 1947 (no number)—det. *Ronn.*

T. cilicicus *Boiss. et Bal.* in Boiss., Diagn. Pl. Or. Ser. II, **4**, 8 (1859).

Prov. Antalya, distr. Alanya (Isauria): Han Boğaz forest (S. of Geyik Dağ) 1820 m., in gravel of dry stream bed and along its sides, fl. violet-purple, Aug. 30, 1947, No. 14647; *ibid.*, 1600 m., in dry river bed, No. 14721.—det. *Ronn.*

T. hirsutus M.B. var. **cherlerioides** (*Vis.*) *Ronn.* in Rech. fil., Fl. Aegaea, 541 (1943).

Prov. Antalya, distr. Alanya (Isauria) : Geyik Dağ, 2130 m., Aug. 31, 1947, No. 14530 (with old leaves glabrescent) ; *ibid.*, 2590 m., No. 14569.—det. Ronn.

T. longicaulis Presl f. **albiflorus** Berger in Allg. Bot. Zeitschr. **20**, 15 (1914).

Prov. Muğla, distr. Köyceğiz (Caria) : Sandras Dağ, near Gökce Ova, 1700 m., fl. white, Jul. 23, 1947, No. 13497.—det. Ronn.

T. sipyleus Boiss., Diagn. Pl. Or. Ser. I. **5**, 16 (1844) (*typica* : dentes calycis superiores ciliati).

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ, above Geyran Yaylâ, 1820–2130 m., Jul. 16, 1947, No. 13362a.—det. Ronn.

var. **davisianus** Ronn., var. nov.

Folia utrinque breviter pilosa ; calycis tubus pilis brevibus obtectus, ventraliter ciliatus ; dentes calycis superiores pilis unicellularibus ciliati, sub lente glabrescentes.

Prov. Muğla, distr. Fethiye (Lycia) : Girdev (Eren) Dağ, S. side of mountain, 2000 m., Aug. 5, 1947, No. 13833.—det. Ronn.

var. **imbricatus** (Čel.) Ronn. in Rech. fil., Fl. Aegaea, 540 (1943).

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ, above Geyran Yaylâ, 1820–2130 m., Jul. 16, 1947, No. 13362 b (with the typical form).
Prov. Muğla, distr. Köyceğiz (Caria) : Sandras Dağ, 2200 m., Jul. 23, 1947, No. 13543.—det. Ronn.

var. **imbricatus** (Čel.) Ronn. f. **rhodochrous** Ronn., forma nov.

Calyces rubescentes, corollae roseo-lilacinae.

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Dağ, 2100–2300 m., fl. rosy lilac, Aug. 16, 1947, No. 14120.—det. Ronn.

var. **punctatus** Ronn., var. nov.—*T. punctatus* Visiani in Mem. Ist. Venet. **1**, 1842, 43 (1843), non Willd. (1794)=*Ziziphora clinopodioides* M.B.

Prov. Ankara (Galatia) : Beynam, 1200 m., shaly S. slope, erect, lemon-scented, white-flowered, Jul. 5, 1947, No. 13104.—det. Ronn.

T. toseovii Vel. f. **leucanthus** Deg. et Urum. in Stoj. et Stef., Fl. Bulg. 970 (1924).

Prov. Denizli, distr. Acipayam (Caria) : Boz Dağ, between Abbas and Geyran Yaylâ, 1370 m., flowering stems erect, fl. white, Jul. 16, 1947, No. 13349.—det. Ronn.

Ziziphora capitata L., Sp. Pl. 21 (1753).

Prov. Ankara (Galatia) : Hacikadun valley near Kecioren, by stream, Jul. 9, 1947, No. 13175.

Z. clinopodioides M.B. var. **canescens** Benth., Lab. Gen. et Sp. 321 (1833).

Prov. Muğla, distr. Fethiye (Lycia) : Girdev (Eren) Dağ, 2200 m., fl. pale mauve, Aug. 3, 1947, No. 13779. Prov. Antalya, distr. Alanya

(Isauria) : Geyik Dağ, 2130 m., in gravel of dry stream-bed, Aug. 31, 1947, No. 14526.

Addendum.

Attention is drawn to the correct dates of publication of volumes 4 and 5 of Boissier's *Flora Orientalis* which are found in libraries bearing the dates 1879 and 1884 respectively. Both these volumes were published in two separate fascicles as follows : Vol. 4 (1) 1-280 (1875) ; Vol. 4 (2) 281-1276 (1879) ; Vol. 5 (1) 1-428 (July 1882) ; Vol. 5 (2) 429-868 (April 1884).

There is no dated title page to the first fascicle of each volume ; only the cover bears the correct date of publication, but this has in most cases been removed in binding the two parts together. The dated title page of the second fascicle (which, unlike its cover, does not indicate to which fascicle it belongs) has therefore been used as the title page for the whole volume. (cf. Buhse, Fl. Or. suppl. p. xxvi : 1888).

Taenioma perpusillum (J. Ag.) J. Ag.-*Taenioma*, a genus of two species with a wide distribution, has been a subject of contention since its original publication. Agardh placed it amongst the *Rhodomelaceae*. It was soon removed to *Delesseriaceae*, where according to recent researches by Tseng and Papenfuss it seems firmly established in spite of attempts to restore it to the *Rhodomelaceae*. Their main argument is that the formation of the pericentral cells without exception so far, follows the same sequence within the family.

As there has also been a good deal of controversy about the validity of keeping apart the two species *T. perpusillum* and *T. macrourum* I would like to draw attention to some material I have received from the Gold Coast. It was collected at Sekondi (about 5° N. Lat.) by Miss V. J. Foote of Achimota. In a preliminary scrutiny of the collection I came across one small gathering of a plant which answers in detail to the descriptions of *T. perpusillum*. It confirms the observation of Papenfuss that the three monosiphonous terminal hairs are a constant feature. Papenfuss states that cystocarps have been observed with certainty only by Thompson (1910) and since I have myself not come across any later reference to the finding of cystocarps, and as fruiting habits of the Algae are often unpredictable, it is worth while recording that this Gold Coast material collected in April has abundant mature cystocarps.

C. I. DICKINSON.

ADDITAMENTA AD FLORAM ANATOLIAE : II.*

P. H. DAVIS.

After the first part of this series appeared, I was able to make another expedition in Southern Anatolia, from Lycia to the Amanus Mountains, during the summer of 1949. Despite an exceptionally arid year, a herbarium of about 1,700 gatherings was made; this has been added to my 1947 collection so that both can be determined together. To get into step, however, I am annotating in Part 2 the *Labiatae* of my 1949 journey, that family having been the subject of Part 1 of this series.

A note is required on earlier botanical work done in the area traversed in 1949. In the Lycian Taurus, Tahtali Dağ (ancient Solyma) was botanised by the writer in 1947, but had not been previously explored; Çalbali (Bereket) Dağ was climbed by Pestalozza over a century ago. The floras of these two mountains, though so close together, are curiously dissimilar. The area is very rich in endemics, several of which (e.g. *Dorystaechas hastata* Boiss. et Heldr., *Globularia davisiana* O. Schwarz and *Asyneuma pulvinatum* P. H. Davis) are undoubtedly relicts.

The painfully difficult journey through the Pisidian mountains between Antalya and the lake of Beyşehir was through a region almost unexplored botanically, though Dedegöl Dağ (part of Anamas Dağ) or an adjacent mountain appears to have been hastily visited by the indefatigable Heldreich in 1845. Here the flora of Bozburun Dağ (with the upper 1000 m. composed of calcareous conglomerate) was very different from that of the cold limestone massif of Dedegöl Dağ further north—a fact which shows how important it is to explore the many neglected peaks and ranges of Asia Minor. The supply of new species seems inexhaustible.

The neighbourhood of Ermenek in the Isaurian Taurus was botanised by Heldreich in 1845, and superficially by Péronin in 1872; in 1948 it was visited by A. Huber-Morath, H. Reese and J. Renz. The region, consisting of a mosaic of chalky hills and areas of compact limestone cut by deep ravines, is botanically rich. My journey from Ermenek to Anamur took me through a region of the Taurus that was previously unbotanised. Bulgar Dağ in Cilicia has of course been visited by several collectors since Kotschy's pioneer journey of 1836, and its flora is now relatively well-known. In the Amanus, Didilil Dağ may only have been botanised by Haradjian in 1908, although it is possible that Ina Meincke collected there (see note under *Stachys amanica* P. H. Davis below). The salt lakes of Central Anatolia do not appear to have been previously visited in late summer, when the *Chenopodiaceae* are best developed.

As so much of the country visited in 1949 was through little-known territory, a concise itinerary is given below. The journey was complementary to that of my 1947 expedition, an account of which appeared in *J. Roy. Hort. Soc.* **74** (3-4) : 1949. In 1949, except on the days indicated, I travelled with horses. The expedition has been described for the same horticultural journal (**76** (2) : 1951). My itinerary was as follows :—

*Continued from *Kew Bull.* **1949**, 393-426 (1949).

1. *Eastern Lycian Taurus (Prov. Antalya) ; accompanied by Kâmil Bilger and A. Attila.*

July 7 : Antalya to Kemer by motor-boat, with a visit to Gönük Da. **8 :** Kemer to Kuzdere Y. (900 m.) on Tahtali Da. **9 :** to Çukur Y. (1650 m.). **10 :** climbed Tahtali Da. (2375 m.) on foot up the W. side, returning to Çukur Y. down the N. side via Peynirlik Y. **11 :** from Çukur Y. northwards to Ovacik (1100 m.) on E. flank of Teke Da. **12 :** visited E. slopes of Teke Da. **13 :** Ovacik to Tepedelen Y. (1700 m.) on Çalbalı (Bereket) Da., via Söğüt Cuması Y. (1300 m.). **14 :** climbed Çalbalı Da. (2262 m.) on foot up the N. side from Tepedelen Y., descending to Fesliken Y. (1800 m.) via Kar Çukuru Y. **15 :** visited cliffs E. of Fesliken Y., then, via Çukur Ardiç Y., to Söğüt Y. (1200 m.) for the night. **16 :** to Antalya, via Çakırlar and the sea-shore. **17-20 :** in Antalya, with excursion to Termessus on July 19 by car.

2. *Pisidian mountains between Antalya and Beyşehir Lake (Prov. Antalya, Isparta and Konya) ; accompanied by Kâmil Bilger.*

July 21 : Antalya to Gebiz by car, via mouth of the Aksu Ça. **22 :** to Pinargözü (600 m.) on S.W. flank of Bozburun Da. **23 :** to Boğaz Ağzi. **24 :** to Tozlu Çukur Y. (1900 m.) on N. side of Bozburun Da. **25 :** climbed on foot as near as possible to top of Bozburun Da. (2504 m.), descending N.E. side to Taşlı Y. (1700 m.). **26 :** at Taşlı Y. **27 :** northwards to Kuzdere (1100 m.) in Kozlu D. **28 :** to Koca Pinar Çe. (1500 m.) on W. side of Sarp Da., via Çimen Ov. **29 :** to Tota Beyli Y. (1500 m.), via W. side of Kuyucuk Da. **30 :** to Selköşe (1200 m.), via Daribükü (900 m.)—all day on metamorphic rocks. **31 :** at Selköşe.

Aug. 1 : to Oruz Gaz Y. (1700 m.) on S. flank of Dedegöl Da. (limestone starts at 1400 m.). **2 :** to Taş Oluk Y. (2100 m.) on Dedegöl Da., via 2400 m. pass (difficult for horses!) and cirque called Anıç (2200 m.). **3 :** on foot to summit of Dedegöl Da. (2980 m.) via the tarn Dedegöl (2300 m.); returned to Taş Oluk Y. **4 :** to Hoyran, via Çamurlu Y. **5 :** motor-boat to Beyşehir, bus to Konya. **6-10 :** in Konya.

3. *Taurus between Karaman and Anamur (Prov. Konya and Mersin ; Isauria and Cilicia Trachea).*

Aug. 11 : Konya to Karaman by bus. **12 :** to Ermenek by post-bus. **13 :** around Ermenek. **14 :** hired lorry to Oyuklu Da. (near pass between Karaman and Ermenek), via Kamiş D. ; returned to Ermenek. **15 :** from Ermenek southwards to Sarıvadi, via Göksu Ça. (600 m.). **16 :** to Beşkuyu (1800 m.) via Hamitseydi Boğ. (1500-1700 m.). **17 :** to Çamurlu Y. (2100 m.). **18 :** to Kükür (700 m.), crossing the range in the vicinity of Deliktaş Da. and via Olucak Y. (1500 m.). **19 :** to Anamur, via Sarıdana. **20 :** to Silifke by post-bus, via Gülnar. **21 :** to Mersin by lorry. **22-24 :** in Mersin.

4. *Dıldil Dağ in Amanus (Prov. Adana, distr. Bahçe).*

Aug. 25 : Mersin to Haruniye by train. **26 :** to Atlık Y. (1700 m.) on Dıldil Da., via Gökçayır (420 m.). **27 :** on foot to summit of Dıldil Da. ; returned to Haruniye via Başkonuş Y. (1700 m.) and Huseyin Oluk Çe. (1400 m.). **28 :** Haruniye to Mersin by train. **29-30 :** in Mersin.

5. *Bulgar Dağ in Cilician Taurus (Prov. Adana and Niğde).*

Aug. 31 : Mersin to Pozanti by train, with excursion to Cilician Gates (Külek Boğ.) by hired lorry. **Sept. 1** : Pozanti to Meydan Y. (2400 m.) on E. flank of Bulgar Da. **2** : to Sari Tepe Y. (2700 m.) on Kizil Tepe. **3** : descent to Çiftehan, via Alihoca (1300 m.). **4** : train to Konya. **5-6** : in Konya. **7** : excursion to Bozkir by car.

6. *Tuz Gölü (Prov. Konya ; Lycaonia).*

Sept. 8 : Konya to Cihanbeyli by car, visiting the small salt lake, Acituzgölü. **9** : by car to Yavşan Memlehasi near Tuz Gölü ; visited the lake by using the light railway of the salt factory ; by car to Ankara.

In the annotation I have taken the Gökusu Deresi in the region of Ermenek as the boundary between Isauria (to the N.) and Cilicia Trachea (to the S.). To avoid the tricky question of genitival endings, the contractions proposed by the Permanent Committee on Geographical Names for British Official Use in *Glossaries* : 7, *Turkish* (1945) have been adopted. These are : *Boğ.* for *Boğaz* (gorge), *Ça.* for *Çay* (river), *G.* for *Göl* (lake), *D.* for *Dere* (valley), *Da.* for *Dağ* (mountain), *Ov.* for *Ova* (plain), and *Y.* for *Yayla* (summer pasture) ; to these I have added *Çe.* for *Çeşme* (spring).

I am deeply indebted to The Cross Trust and to the Royal Horticultural Society for generous grants towards the cost of the expedition. I also wish to thank Dr. A. Huber-Morath, whose journeys in Anatolia are leading to the discovery of so many new plants, for collaboration in the naming of certain new species.

LABIATAE (continued)**Ajuga chia** Schreb., Pl. Vert. Unilab., 24 (1774) var. **chia**.

Prov. Isparta, distr. Sütçüler (Pisidia) : between Tota Beyli Y. (on Kuyucuk Da.) and Daribükü, fallow fields, metamorphic substrate, fl. yellow, 30 Jul. 1949, 15896 ; Sarp Da., above Kuzdere, fallow land, 28 Jul. 1949, 15828. Prov. Konya, distr. Beyşehir (Isauria) : Hoyran, fallow fields, fl. yellow, 5 Aug. 1949, 16119.

var. **latiloba** Boiss., Fl. Or. 4, 803 (1879).

Prov. Antalya, distr. Gebiz (Pisidia) : Bozburun Da. above Çukur Y., 900-200 m., 25 Jul. 1949, 15622.

var. **suffrutescens** Boiss. Fl. Or. 4, 803 (1879).

Prov. Isparta, distr. Sütçüler (Pisidia) : Çimen Ov. on W. side of Sarp Da., 1500 m., 28 Jul. 1949, 15799.

f. inter var. **suffrutescentem** Boiss. et var. **latilobam** Boiss.

Prov. Antalya (Lycia) : Çalbalı Da., 2000-2100 m., 14 Jul. 1949, 15283. Prov. Niğde, distr. Ulukışla (Cilicia) : Bulgar Da. near Sari Tepe Y. above Alihoca, 2 Sept. 1949, 16569.

Further work is needed on the forms of *A. chia* Schreb., particularly with reference to var. *suffrutescens* Boiss. and var. *tridactylites* (De Ging ex Benth.) Boiss. which are difficult to distinguish from one another. Although Turrill (New Phytol. 33, 225 : 1934) has recorded var. *tridactylites* from Asia Minor, I have preferred to name my similar Anatolian forms var. *suffrutescens*. *A. chia* var. *tridactylites* was originally

described (as a species) from Sinai and Lebanon, and was said to have a pink corolla—a feature which I have never seen in any form of *A. chia* from Palestine to Greece, although in pressed specimens the red pigment of the corolla-spots sometimes 'runs'. Boissier (Fl. Or. 4, 808) gives a more southerly distribution to var. *tridactylites* than to var. *suffrutescens*, and does not record the former from Turkey.

The typical form of *A. chia* is mainly a plant of fallow fields in the Levant, being often replaced by var. *suffrutescens* in more stable natural habitats, and in rocky alpine regions in the Taurus by var. *latiloba*. Many intermediates occur.

Ballota cristata P. H. Davis in Kew Bull. 1949: 394 (1949).

Prov. Antalya, distr. Kemer (Lycia): Tahtali Da. at Gürleyik Y., 1400 m., 9 Jul. 1949, 15128; Teke Da. near Ovacik (above Kemer), where woods have been cleared, often co-dominant with *Phlomis grandiflora*, 12 Jul. 1949, 15338; distr. Gebiz (Pisidia), on Bozburun Da. between Pinargözü and Boğaz Ağzi, 1400 m. 23 Jul. 1949, 15501; and in Kozlu D., N. of Bozburun Da., 1100–1200 m., stony slopes, 27 Jul. 1949, 15753.—One of the commonest subalpines in Pisidia and Eastern Lycia.

Ballota saxatilis Sieber ex J. & C. Presl, Delic. Pragenses, 1, 81 (1822).

Prov. Konya, distr. Ermenek (Isauria): Ermenek, rocks, fl. purple, 13 Aug. 1949, 16153; Kaniş D. (between Ermenek and Oyuklu Da.), rocky places, fl. purple, 14 Aug. 1949, 16174. Prov. Konya, distr. Ermenek (Cilicia Trachea): Hamitseydi Boğ. between Sarivadi and Beşkuyu (S. of Ermenek), rocks, 16 Aug. 1949, 16240; between Beşkuyu and Çamurlu Y. (S. of Ermenek) in crevices of outcropping rocks, 1900 m., 17 Aug. 1949, 16267. Prov. Adana, distr. Bahçe (Amanus): Gökçayir at foot of Dildil Da., in limestone ravine, sloping rocks, stems erect, fl. purplish pink, 27 Aug. 1949, 16417 (*forma caulibus strictis erectis, indumento calycum et foliorum brevissime stellato-tomentoso, foliis paulo minoribus anguste ovatis a typo differt*).

The last gathering cited approaches var. *brachyodonta* Boiss. (*e descr.*), but the calyx-teeth are scarcely shorter than in the typical form of the species.

I am indebted to Mr. B. L. Burt for the following note on the nomenclature of *B. saxatilis*:

"In his paper (J. of Bot. 75, 190: 1937) dealing with Russel's Aleppo plants, Eig adopted for this species the name *B. rugosa* (Banks & Sol.) Benth. This, however, is incorrect. *B. rugosa* Benth. is based not on the *Marrubium rugosum* of Banks & Sol., but on the independently described *M. rugosum* Desf.; the latter being a later homonym, *B. rugosa* Benth. must stand as a new name dating from Bentham's publication, and not as a new combination based on Desfontaine's plant.

"Accepting Boissier's circumscription of this species, *Marrubium rugosum* Banks & Sol. of course provides the earliest epithet, but *Ballota rugosa* Benth. prevents its transference to the latter genus. *B. saxatilis* Sieber is cited by Boissier and others as "ex Benth.", but it was in fact validated by J. & C. Presl (Delic. Pragenses, 1, 81: 1822). *B. saxatilis*

Sieber ex J. & C. Presl therefore provides the earliest name for this species".

Calamintha ascendens Jordan, Obs. Pl. Nouv. Rar. Crit. (4) 8 (1846). (*C. officinalis* Mönch, Meth. 409 (1794) *pro parte et autt., nomen ambiguum*, cf. Pugsley in J. of Bot. 61, 185 : 1923).

Prov. Adana, distr. Bahçe (Amanus) : Dildil Da., between Başkonuş Y. and Hüseyin Oluk Çe., 1800 m., 27 Aug. 1949, 16394.—The inflorescence is shorter and fewer flowered than in the type.

Calamintha betulifolia Boiss. et Bal. in Boiss., Diagn. Ser. 2 (4) 14 (1859) subsp. nov? ("*Calamintha* sp. nov.?", Davis in Kew Bull. 1949 : 397.)

Prov. Antalya, distr. Kemer (Lycia) : Kesme Boğ. near Kemer, on dry mossy rocks in shade, fl. very pale lilac, 8 Jul. 1949, 15150.

Though adequate flowering material is still not available of this plant, it seems most probable that it represents a new subspecies of *C. betulifolia*. The species is known in its typical form only from Cilicia and Amanus. Forbe's specimen from Finike in Lycia is as glabrescent as in typical *C. betulifolia*, and the calyx is 11 mm. long ; it is therefore intermediate between the latter and my Lycian material from Kemer, which differs from the type mainly in its more hirsute indumentum, and shorter calyx (7–9 mm. long) bilabiate to $\frac{1}{4}$ of its length. More material is needed of this group of *Calaminthae* from between Cilicia and Lycia.

Calamintha nepeta (L.) Savi, Fl. Pisana, 2, 63 (1798).

Prov. Niğde, distr. Ulukışla (Cilicia) : near Alihoca at N. foot of Bulgar Da., 1200–1300 m., erect, fl. violet, 3 Sept. 1949, 16523. Prov. Adana, distr. Bahçe (Amanus) : near Haruniye, 400 m., bank of dry river-bed, erect, fl. pale lilac, 26 Aug. 1949, 16375.

Calamintha organifolia (Lab.) Boiss., Fl. Or. 4, 579 (1879), *sensu lato incl. C. florida* Boiss.,—cf. Davis in Kew Bull. 1949 : 395 (1949).

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Da. near Peynirlik Y., 1600 m., 10 Jul. 1949, 15111. Prov. Isparta, distr. Sütçüler (Pisidia) : Çimen Ov. on W. side of Sarp Da., 1500 m., stony slopes, stems ascending-erect, fl. lilac, 28 Jul. 1949, 15791 ; Dedegöl Da. above Dedegöl tarn, 2400–2500 m., scree, fl. lilac, 3 Aug. 1949, 16001 ; Dedegöl Da. near the cirque Aniçi, corolla mauve, twisted, 2 Aug. 1949, 15993. Prov. Mersin, distr. Anamur (Cilicia Trachea) : Olucak Y. between Ermenek and Anamur, screes, stems \pm erect, corolla white, twisted, 18 Aug. 1949, 16334b. Prov. Niğde, distr. Ulukışla (Cilicia) : Bulgar Da., near Sari Tepe Y., scree, 2700 m., procumbent-ascending, fl. violet, 2 Sept. 1949, 16583 ; Bulgar Da., near Alihoca, ascending-erect, corolla violet, twisted through 180°, 3 Sept. 1949, 16534. Prov. Adana, distr. Karaisah (Cilicia) : Bulgar Da., between Pozanti and Meydan Y., stems procumbent-ascending, 1 Sept. 1949, 16585.

I have been able to examine what is evidently the holotype of *C. organifolia* Lab. in the Webb Herbarium in Florence. This has Labillardière's original description attached to it, and agrees with the figure in his Ic. Pl. Syr. Rar. 4, t. 9 (1812). But I have not seen the type

of *Satureia Labillardieri* Briq. in Herb. Delessert; nevertheless, I feel it must be considered conspecific with *Calamintha origanifolia*.

The Taurus gatherings cited above shows how variable *C. origanifolia* is, and that it is impossible to keep *C. florida* Boiss. specifically distinct from it. In Turkey the stamens are generally exerted and bent downwards, but there is a wide range of variation in indumentum, habit (decumbent forms predominate, but populations with ascending stems occur) and in the form of the bracts and calycine teeth. The only fairly close correlation between these variables seems to be that between woolly indumentum and broad bracts. As with *Sideritis libanotica* Lab., individual populations are relatively uniform, so that the species is made up of a large number of local races. One of the most distinct of these is *Davis* 16334*b* from Cilicia Trachea; this has an ascending-erect habit, woolly indumentum, obovate bracts and white flowers.

Calamintha tauricola P. H. Davis, sp. nov. (Sect. *Calamintha* (Mönch) Benth.).

Affinis *N. betulifoliae* Boiss. et Bal. sed foliis subtus crassinervis, foliibus $\frac{1}{3}$ – $\frac{1}{2}$ minoribus, calyce brevior ad $\frac{1}{4}$ – $\frac{1}{3}$ bilabiato, corolla magis exserta inter alia recedit.

Planta perennis, saxatilis, valde suaveolens. *Caules* floriferi e basi indurato numerosi, simplices vel subramosi, decumbentes, 10–30 (40) cm. longi, tenues, vix quadrangulares, pilis brevissimis glandulosis et eglandulosis et pilis longis eglandulosis paucissimis ut folia vestiti. *Folia* ovato-elliptica, 10–25 mm. longa, 6–15 mm. lata, brevissime petiolata, internodiis breviora, breviter acuminata, basi late cuneata, superne utrinque \pm remote et argute 2–3-serrata, nervatura subtus prominente, nervis lateralibus utrinque \pm 4; floralia caulinis simillima sed sensim diminuta, paulo angustiora, calycibus duplo longiora. *Verticillastra* 3–7-nata, remota, e cymis 1–3-floris breviter pedunculatis et breviter pedicellatis composita. *Bracteae* lanceolatae, acuminatae, 3–4 mm. longae, pedicellis paulo longiores. *Bracteolae* bracteis simillimae sed duplo minores. *Calyx* 6.5–8 mm. longus, manifeste 11-nervosus, ad $\frac{1}{4}$ – $\frac{1}{3}$ bilabiatus, extus pilis brevissimis eglandulosis et glandulosis atque praesertim in parte inferiore pilis longis eglandulosis paucis commixtis vestitus, fauce laxe barbatus; labium superius fere ultra medium in dentes late triangulares acuminatos ciliatos trifidum; labium inferius superiori subaequilongum, in dentes triangulares manifeste acuminatos ciliatos bifidum. *Corolla* roseo-violacea, 17–20 mm. longa, ad $\frac{1}{4}$ – $\frac{1}{3}$ bilabiata, extus et intus pubescens; labium superius inferiore duplo brevius, ad $\frac{1}{3}$ retusum; labium inferius barbatum, trilobatum, lobo mediano orbiculare lateralibus late ovatis obtusissimis duplo longiore. *Stamina* anteriora posterioribus multo longiora. *Nuculae* sub-orbiculares, 1.5 mm. longae, 1.25 mm. latae, obtusae, laeves, pallide brunneae.—Floret Jul.–Aug.

Prov. Konya, distr. Ermenek (Cilicia Trachea): Hamitseydi Boğ. between Sarivadi and Beşkuyu (between Ermenek and Anamur), 1500–1700 m., on rocks within the dominion of *Abies cilicia*, very aromatic, fl. violet, 16 Aug. 1949, *Davis* 16225 (*typus* in Herb. Kew.). Prov. Mersin, distr. Anamur (Cilicia Trachea): between Beşkuyu and Çamurlu Y. (between Ermenek and Anamur), 1900 m., fl. pink-violet, 17 Aug. 1949, 16281 (*forma* in umbra crescens).

Unlike *C. betulifolia* Boiss. et Bal. and *C. pamphylica* Boiss. et Heldr. ex Benth., which have a minty smell, *C. tauricola* smells strongly of a mixture of sweet apples and pineapple. Other characters, beyond those given in the diagnosis, to separate it from *C. betulifolia* are its more congested and fewer-flowered whorls, and the fewer leaf-serrations that are usually drawn out into a sharper point. Typical *C. betulifolia* has only been recorded to the East of *C. tauricola*; the former grows in the main Cilician Taurus massif and in the Amanus.

Calamintha vulgaris (L.) Druce in Ann. Scot. Nat. Hist. 1906 : 224 (1906). (*Clinopodium vulgare* L., Sp. Pl. 587 : 1753).

Prov. Antalya, distr. Gebiz. (Pisidia) : Bozburun Da., between Boğaz Ağzi and Tozlu Çukur Y., 1500 m., 24 Jul. 1949, 15569 & 15518. Prov. Adana, distr. Bahçe (Amanus) : Dildil Da., between Gökçayir and Atlik Y., 1500 m., 26 Aug. 1949, 16449; Dildil Da., between Başkonuş and Huseyin Oluk Çe., 1800 m., 27 Aug. 1949, 16406.

Dorystaechas hastata Boiss. et Heldr. apud Benth. in D.C., Prodr. 12, 261 (1848).

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Da., fl. white, 10 Jul. 1949, 15048; Tahtali Da. at Gürleyik Y., 1500 m., 9 Jul. 1949, 15123; between Ovacik (on Teke Da.) and Söğüt Cumasi Y. (near Calbali Da.), about 50 per cent. of the bushes setting fruit, 13 Jul. 1949, 15239.

In the field it was noticed that only about half of the bushes of this monotypic genus bore fruit, suggesting that the species is dioecious. Examination of rather limited dried material shows that in the form that does not fruit the stamens and style both appear to be fully developed, though the ovules and calyces fail to enlarge after flowering. In the sex form that fruits (evidently female) the gynoeceum is fully developed, but the stamens are partially aborted or absent; the calyces and ovules enlarge after anthesis—a feature readily noted in the field. *Dorystaechas*, in fact, though morphologically gynodioecious, appears to be functionally dioecious, the morphologically hermaphrodite form being physiologically male.

Lamium striatum Sibth. et Sm., Fl. Gr. 6, 46 (1827) var. **striatum**.

Prov. Isparta, distr. Sütcüler (Pisidia) : Dedegöl Da. at Dedegöl-tarn, 2400 m., shady scree, fl. mauve-pink, 3 Aug. 1949, 16028.

var. **minum** Boiss., Fl. Or. 4, 757 (1879).

Prov. Antalya (Lycia) : Çalbalı Da., 2000–2100 m., among shady rocks, fl. purplish pink, 14 Jul. 1949, 15281; distr. Gebiz (Pisidia), Bozburun Da. above Tozlu Çukur Y., foot of N. cliffs, 25 Jul. 1949, 15611.

var. **reniforme** (Montbr. et Auch.) Boiss., Fl. Or. 4, 757 (1879).

Prov. Mersin, distr. Anamur (Cilicia Trachea) : between Çamurlu Y. and Olucak, 18 Jul. 1949, 16295.

f. inter typicum et var. **minum** Boiss.

Prov. Antalya (Lycia) : Çukur Ardiç Y. near Çalbalı Da., 15 Jul. 1949, 15379.

I accept Boissier's circumscription of this species until the group can be revised.

Lycopus europaeus L., Sp. Pl. 21 (1753).

Prov. Konya, distr. Beyşehir (Isauria) : Hoyran, damp fields, fl. white, 5 Aug. 1949, 16112.

Marrubium astracanicum Jacq. subsp. **macrodon** (Bornm.) Davis, comb. et stat. nov. (*M. macrodon* Bornm. in Beih. Bot. Centr. 24 (2) 489 : 1909.)

Prov. Antalya, distr. Gebiz (Pisidia) : Bozburun Da., between Taşlı Y. and Kozlu D. 1600 m., fl. violet, 27 Jul. 1929, 15726 (*forma foliis caulinis ovatis grosse et acute crenato-serratis a typo speciei differt*).

Bornmüller described his *M. macrodon* from material collected on Sultan Dağ in Phrygia (about 150 km. N. of Bozburun Da.), and compared it with *M. heterodon* (Benth.) Boiss. et Bal. on account of its long calyx-teeth. But it is so close to *M. astracanicum* Jacq. (including *M. kotschyi* Boiss. et Hoh.) that I find it necessary to treat it as a subspecies of that polymorphic denizen of Anatolia, Iraq and Persia. Another specimen that must also be referred to subsp. *macrodon* is *Sintenis 1565* from Paphlagonia (Mt. Bellova near Tossia) ; the station is far distant from Bornmüller's original locality, but seems to have some floristic affinities with the Taurus : *Sintenis*, as a matter of fact, collected *M. heterodon* in the same area, although the species has been found elsewhere only in the Cilician Taurus.

The type of variation that occurs in the leaf-form and bract-indumentum of subsp. *macrodon* is repeated in *M. astracanicum*, *sensu stricto*. In the isotype of the subspecies at Kew the calyx-teeth are at least as long as the tube, but in *Davis 15726* and *Sintenis 1565* they are very slightly shorter. Forms of *M. astracanicum* with the teeth $\frac{1}{3}$ the length of the calyx, collected in the Cilician Taurus, are represented in the Kew Herbarium, and evidently link subsp. *macrodon* to the typical short-toothed form of the species.

Marrubium bourgaei Boiss., Fl. Or. 4, 698 (1879) subsp. **bourgaei**.

Prov. Antalya (Lycia) : Çalbalı Da. 2000–2100 m., fl. whitish, 14 Jul. 1949, 15295 ; distr. Kemer, Tahtalı Da. at Gürleyik Y., 1400 m., 9 Jul. 1949, 15127.

M. bourgaei subsp. *bourgaei* is a constantly flavescent plant of fairly dwarf and slender habit. It is very variable : the leaves may be thin and rather narrowly obovate (as in *M. heterodon* Boiss. et Bal.), or they may be obovate-orbicular and of thicker texture due to more pannous indumentum. The indumentum of bracts and calyces varies from plumose with predominantly simple hairs (as in the type, and thereby recalling *M. heterodon*) to predominantly stellate, as in *M. globosum* Montbr. et Aucher subsp. *libanoticum* (Boiss.) Davis. The flowering stems are covered with tawny, largely stellate indumentum, but the slender sterile shoots bear a short, close, lanate covering of dirty white colour. *M. bourgaei* Boiss. subsp. *caricum* Davis (in Kew Bull. 1949 : 399) is a taller, more robust plant than the typical form of the species, with thicker, somewhat sericeous (though still flavescent) leaves and larger whorls. In habit it resembles the Pisidian forms of *M. globosum* enumerated below, but its longer, slightly spreading bracts with predominantly stellate indumentum show that the affinity of the Carian plant is with *M. bourgaei*.

Marrubium globosum *Montbr. et Auch.* apud Benth. in *Ann. Sc. Nat. Bot. Ser. 2*, **6**, 63 (1836) subsp. **globosum** (*incl. M. faucidente* Boiss. et Bal. in Boiss., *Diagn. Ser. 2*. (4) 50 : 1859).

Prov. Antalya, distr. Gebiz (Pisidia) : Bozburun Da., between Boğaz Ağzi and Tozlu Çukur Y., 1700 m., 24 Jul. 1949, 15576 ; Bozburun Da., between Taşlı Y. and Kozlu D., abundant, 25 Jul. 1949, 15733 ; Bozburun Da. near Tozlu Çukur Y., 24 Jul. 1949, 15584. Prov. Isparta, distr. Sütçüler (Pisidia) : Dedegöl Da. at Taş Oluk Y., 2100 m., scree, 2 Aug. 1949, 16066 ; Dedegöl Da. at Oruz Gaz Y., 1 Aug. 1949, 15944—*plantae Pisidiae omnes bracteis brevioribus a typo M. faucidentis Boiss. et Bal. divergit.* Prov. Adana, distr. Bahçe (Amanus) : Dildil Da., between Gökçayır and Atlik Y., 1600 m. 26 Aug. 1949, 16452 (*fruct.*) ; Dildil Da. above Atlik Y., 1900 m., 27 Aug. 1949, 16429 (*fruct.*)—*plantae Amani indumento calycis e pilis simplicibus et stellatis composito a typo M. faucidentis Boiss. et Bal. differt.*

subsp. **libanoticum** (*Boiss.*) *Davis*, comb. et stat. nov. (*M. libanoticum* Boiss., *Diagn. Pl. Or. Ser. 1* (12) 73 : 1853.)

subsp. **micranthum** (*Boiss. et Heldr.*) *Davis*, comb. et stat. nov. (*M. micranthum* Boiss. et Heldr. apud Benth. in DC., *Prodr.* **12**, 449 : 1848.)

Prov. Konya, distr. Ermenek (Isauria) : Oyuklu Da. near Kaya Pınarı Çe. (between Ermenek and Karaman), 1800–1900 m., 14 Aug. 1949, 16163 ; Ermenek, 1300–1400 m., 13 Aug. 1949, 16158 (*forma dentibus calycis villosissimi tubum aequantibus*).

f. inter subsp. **micranthum** (*Boiss. et Heldr.*) *Davis* et subsp. **globosum**.

Prov. Mersin, distr. Anamur (Cicilia Trachea) : between Beşkuyu and Çamurlu Y. (between Ermenek and Anamur), 1900 m., abundant on stony slopes, fl. white, 17 Aug. 1949, 16269.

The circumscription of several species in Sect. *Marrubium* Benth. Subsect. *Quinquidentata* Briq. presents considerable difficulties. There can have been few groups in which Boissier so narrowly interpreted the species in his *Flora Orientalis*. I have been able to examine several of these in the field, and must now take a wider view of *M. globosum* than that adopted by Boissier with less material at his disposal. Many forms play an important part in the alpine phytosociology of the Near East, being often dominant on the mountain sides.

M. globosum was originally described from Ak Dağ in Cappadocia. The isotype in the Kew Herbarium has narrowly obovate stem-leaves with the lamina twice as long as broad ; they are not excessively felted, and the gathering may possibly be a shade form. Later gatherings from Western Anatolia assigned to this species (*Tmolus in Caria* (*Boiss.*), *Bey Dağ* in Lycia (*Pichler*), etc.) have broader, obovate-orbicular stem-leaves with a much denser indumentum. Borgeau's plant from Lycian Ak Dağ has narrower leaves than in the type, but the sericeous indumentum of the other forms. The closest match with the type is *Bornm.* 607 from the Ak Dağ near Amasya.

M. faucidens Boiss. et Bal. was based on material collected in a rather dried-up summer state near the Cilician Gates. I cannot distinguish the calyx-shape of *M. faucidens* from that of *M. globosum*, the main difference being in the calycine indumentum, which is less woolly in the former

plant. The habit of *M. faucidens* is that of the round-leaved, densely felted forms of *M. globosum* referred to in the preceding paragraph. Other specimens from the Cilician Taurus (*Siehe* 164 & 215, *Kotschy* 455 & 456) fall morphologically between *M. faucidens* and *M. globosum*, and the same applies to *Haradjian* 1698 from Akher [Ahir] Dağ near Maraş. There is, in fact, such an array of intermediate forms that I find it impossible to separate *M. faucidens* from the variable *M. globosum*, and am doubtful if even varietal rank should be assigned to it. I therefore take a rather wide view of subsp. *globosum*, and include under it not only *M. faucidens* but also all my Pisidian gatherings, which differ from the type of *M. faucidens* in their shorter bracts. When more material is available from the *locus classicus* of *M. globosum* it may be desirable to name some geographical races that are included here under the typical subspecies. The species is gynodioecious.

I have also felt obliged to reduce *M. libanoticum* Boiss. and *M. micranthum* Poiss. et Heldr. to subspecies of *M. globosum*. My specimens from the Amanus (cited above under subsp. *globosum*), and also *Haradjian* 3834 from the same mountain, though resembling the type of *M. faucidens*, have a substellate indumentum on the calyx which links them on to *M. libanoticum*—a plant which Boissier distinguished from *M. globosum* by the stellate nature of its calycine indumentum. Even in the Lebanon, stellate indumentum is not constant in *M. libanoticum*; specimens collected there by Post, Bornmüller and myself, and even by Boissier (who cited them under the original description) have long simple hairs on the calyx mixed with the stellate ones.

M. micranthum is a small plant, especially in leaf, and the lowest whorls are normally peduncled. But in *Davis* 16269 the whorls are sessile, and the plants are evidently intermediate between *M. micranthum* and the Pisidian gatherings of subsp. *globosum*. I have therefore reduced *M. micranthum* to subspecific rank. In the Isaurian Taurus this subspecies replaces subsp. *globosum* which reappears to East and West of it, just as *Sideritis libanotica* Lab. subsp. *violascens* (Davis) Davis replaces subsp. *linearis* in the same area. It might be noted that the length and posture of the calyx-teeth varies considerably in *M. globosum* subsp. *micranthum*.

d/ In its very appressed sericeous indumentum the Pisidian gatherings of *M. globosum* bear a resemblance to *M. rotundifolium* Boiss. from Lycia. The latter, however, can be distinguished from all forms of *M. globosum* as circumscribed here by its large floral leaves that are broadest in the middle (or even below it) instead of above it. The only other species that comes very close to *M. globosum* is *M. bourgaei* (see above); part of *Pichler* 539 (from Bey Dağ in Lycia) may consist of a hybrid between these two species, both of which Pichler collected in the same locality.

A key is given below to the species most closely allied to *M. globosum*, including closely related Balkan forms. The distribution given is for material examined in the Kew Herbarium. I have excluded from the key *M. friwaldskyanum* Boiss., treated by Hayek (*Prodr. Fl. Pen. Balc.* 2, 254) as a variety of *M. velutinum* Sibth. et Smith; in my view it is well separated from the latter and from other species in this complex, being a plant of much coarser habit.

Key to the species and subspecies closely related to *M. globosum*
Montbr. et Auch.

Calyx teeth slightly longer than the tube, overtopping the corolla (Greece)
M. velutinum Sibth. et Sm.

Calyx teeth shorter than the tube and corolla :

Bracts at least as long as the calyx-tube, slightly spreading :

Calyx teeth patent (Peloponnesus, Albania (var. *albanicum* Rech. fil.)
M. cyllenaenum Boiss. et Heldr.)

Calyx teeth usually erect :

Calycine teeth unequal, the longer pair nearly as long as the tube
(Cilicia, Paphlagonia) . . . *M. heterodon* (Benth.) Boiss. et Bal.

Calycine teeth subequal, considerably shorter than the tube :

Stem-indumentum pannous ; leaves silvery (Thessaly) . . .
M. thessalum Boiss. et Heldr.

Stem-indumentum stellate ; leaves flavescent :

Leaves not shining ; height 15–30 cm. (Lycia)
M. bourgaei Boiss. subsp. *bourgaei*.

Leaves shining ; height 30–40 cm. (Caria)
M. bourgaei Boiss. subsp. *caricum* Davis.

Bracts shorter than the calyx tube, appressed :

Lamina of the floral leaves widest above the middle, 0.8–2.0 cm.
long, petioled :

Lowest whorls pedunculate (Isauria)
M. globosum Montbr. et Auch.
subsp. *micranthum* (Boiss. et Heldr.)
Davis.

All whorls sessile :

Indumentum silvery ; calyx-indumentum woolly or hirsute,
rarely substellate ; stems 15–35 (40) cm. tall (Cappadocia,
Amanus, Cilicia, Pisidia, Lycia, Caria)

M. globosum Montbr. et Auch. subsp. *globosum*

Indumentum flavescent (excl. var. *hermone* Boiss.—*non vidi*) ;
calyx indumentum usually stellate ; stems 12–25 cm. tall
(Lebanon) *M. globosum* Montbr. et Auch.
subsp. *libanoticum* (Boiss.) Davis.

Lamina of the floral leaves widest ~~above~~ the middle, 2–3, 5 cm. long, /at
subsessile (Lycia) *M. rotundifolium* Boiss. /d

Marrubium heterodon (Benth.) Boiss. et Bal., in Boiss., Diagn. Ser. 2
(4) 52 (1859).

Prov. Adana, distr. Karaisah (Cilicia) : Bulgar Da., near Meydan Y.
above Pozanti, 2400 m., 1 Sept. 1949, 16591 & 16545.

Marrubium lutescens Boiss., Diagn. Ser. 1 (5) 34 (1844).

Prov. Isparta, distr. Sütçüler (Pisidia) : Dedegöl Da., below Oruz
Gaz Y., on limestone, scarce, 1 Aug. 1949, 15902.

In its only slightly flavescent indumentum this gathering matches
Phrygian material of the species (Sultan Da., Bornn. 5469 ; Mourad Da.,
Bal. 1183).

Marrubium parviflorum Fischer et Meyer, Ind. Petrop. 1, 33 (1835).

Prov. Isparta, distr. Sütçüler (Pisidia) : Çimen Ov. on W. side of Sarp. Da., fl. white, 28 Jul. 1949, 15795 (*forma verticillastris inter se congestis*).

Mentha L.—I list my gatherings at the broad specific level only, pending more critical determination by Dr. F. Petrak.

Mentha aquatica L., Sp. Pl. 576 (1753).

Prov. Antalya, distr. Elmali (Lycia) : Kara G. near Yuva, 1000 m., marshes (♂) 7 Aug. 1947, 13930. Prov. Konya, distr. Beyşehir (Isauria) : Hoyran (♂), 5 Aug. 1949, 16116.

Mentha longifolia (L.) Huds., Fl. Angl. ed. 1, 221 (1762).

Prov. Ankara (Galatia) : Beynam, by stream, (♂), 5 Jul. 1947, 13029. Prov. Muğla, distr. Fethiye (Lycia) : Girdev Da. 2200 m., (♂, ♀), 3 Aug. 1947, 13784 ; distr. Köyceğiz (Caria), Ağla on Sandras Da., 600 m., by water, fl. mauve (♂), 25 Jul. 1947, 13634. Prov. Antalya (Lycia) : Çalbalı Da. at Tepedelen Y., (♂, ♀), 13 Jul. 1949, 15254 ; distr. Kemer (Lycia), Tahtalı Da. above Kuzdere Y., (♂), 17 Aug. 1947, 14086 ; distr. Alanya (Isauria), Eğri G. at N. foot of Geyik Da., 2000 m., near stream, (♂), 1 Sept. 1947, 14666, and in Kargı Ça. valley near spring called Taşatan, 900 m., (♀), 25 Aug. 1947, 14423. Prov. Isparta, distr. Sütçüler (Pisidia) : between Tota Beyli Y. (on Kuyucuk Da.) and Daribükü, on metamorphic soils, fl. lilac (♂), 30 Jul. 1949, 15889. Prov. Konya (Lycaonia) : between Konya and Kaşınan, fl. violet (♀), 7 Sept. 1947, 14773 ; distr. Beyşehir (Isauria), Hoyran, wet fields, (♂), 5 Aug. 1949, 16105 ; distr. Bozkir (Isauria), Bozkir vadisi, by river, (♂), 7 Sept. 1949, 16615 ; distr. Ermenek (Cilicia Trachea), Sarivadi, (♂), 15 Aug. 1949, 16215. Prov. Mersin, distr. Anamur (Cilicia Trachea) : Olucak Y. between Ermenek and Anamur, (♂, ♀), 18 Aug. 1949, 16332. Prov. Adana, distr. Bahçe (Amanus) : Haruniye, in damp hedge, 400 m., fl. lavender (♂), 26 Aug. 1949, 16372 ; Dildil Da., between Başkonuş Y. and Hüseyin Oluk Çe., steep gully, fl. lavender (♀), 27 Aug. 1949, 16395.

Though some specimens approach *M. microphylla* C. Kochi either in leaf-form or inflorescence, all have the simple hairs characteristic of *M. longifolia* (L.) Huds. It is certainly the commonest *Mentha* in Southern Anatolia.

Mentha pulegium L., Sp. Pl. 577 (1753).

Prov. Denizli (Caria) : Taş Ocağı near Denizli, fl. pale lilac, 13 Jul. 1947, 13270. Prov. Antalya, distr. Elmali (Lycia) : Kara G. near Yuva, fallow fields, fl. violet-purple, 1000 m., 7 Aug. 1947, 13922 ; *ibid.*, 13925 (*forma floribus albis, cum typo crescens*).

Mentha rotundifolia (L.) Huds., Fl. Angl. ed. 1, 221 (1762).

Prov. Denizli (Caria) : Taş Ocağı near Denizli, fl. white (♀), 13 Jul. 1947, 13239. Rare in the Orient.

Micromeria amana Rech. fil. in Svensk. Bot. Tidskr. 43 (1) 42 (1949).

Prov. Adana, distr. Bahçe (Amanus) : Dildil Da. near Haruniye, on outcrops of metamorphic rocks, 26 Jul. 1949, 16377 (*locus classicus*).

Micromeria aff. cristatae (Hoppe) Gris., Spic. Fl. Rum et Bithyn. 2, 122 (1844).

Prov. Antalya, distr. Gebiz (Pisidia) : Bozburun Da., between Boğaz Ađzi and Tozlu ukur Y., rocks, 24 Jul. 1949, 15561.

Micromeria congesta (Boiss. et Hausskn.) Boiss., Fl. Or. 4, 575, (1879).

(*M. shepardii* (Post) Post in Bull. Herb. Boiss. Ser. 1, 1, 405 : 1893.)

I previously suggested (in Kew Bull. 1949 : 111) that *M. shepardii* (Post) Post was very closely related to *M. congesta* (Boiss. et Hausskn.) Boiss. Since then I have been able to examine the type of *M. shepardii*, and consider that species conspecific with *M. congesta*. It is worth noting that the type of *M. shepardii*, collected at Aintab, matches very well *Sintenis 1403* from Orfa (Urfa) in Mesopotamia, determined as *M. congesta* by Stapf. In the type of *M. shepardii*, and in Post's specimens of that plant from El Weshen in the Syrian desert, the calyx is nearly naked at the throat, but in Post's gathering from Karyatein it is slightly bearded. The last two collections of *M. shepardii* are of dwarfer stature than the type, and recall *M. libanotica* Boiss., which, however, is an alpine species having more slender purplish calyces with a more or less patent indumentum and a villous throat.

It may prove necessary to reduce *M. congesta* to a subsp. of *M. fruticosa* (L.) Druce, but, with the material available, the former's distinctive inflorescence and acute nutlets do not seem to justify that course. *M. congesta* differs phytosociologically from *M. fruticosa* (L.) Druce, *sensu lato* ; the first belongs to the Irano-Turanian element, the second to the Mediterranean and Pontic regions.

Micromeria dolichodonta P. H. Davis, sp. nov. (Sect. *Pseudomelissa* Benth.).

Affinis *M. pulegio* Benth. sed indumento dense et brevissime velutinotomentoso, foliis integris brevissime petiolatis canis haud punctatis ut videtur, nuculis apice acutis apiculatis inter alia facile distinguenda.

Planta perennis, cana, saxatilis, basi indurata turionibus parvis praedita. *Indumentum* caulium et foliorum et pedunculorum et calycum dense sed brevissime et subappresse velutino-tomentosum. *Caules* floriferi erecti, simplices vel superne sparse ramosi, subquadrangulares, 30–50 cm. alti, prope basin 1.5–2.0 mm. lati. *Folia* late ovata, obtusa, plana, firma, basi rotundato-truncata, 1.5–2.0 cm. longa, 1–1.4 cm. lata, brevissime petiolata, ut videtur haud punctata, nervis lateralibus utrinque 3–5 vix prominētibus subtus praedita. *Folia floralia* inferiora caulinis simillima sed basi minus truncata, superiora elliptico-ovata sensim diminuta, summa valde reducta lanceolata vix 2 mm. longa. *Verticillastra* 10–18-nata, distantia, e cymis 5–15-floris sublaxis dichtomo-pedunculatis composita, racemum 10–20 cm. longum, 1–2 cm. latum valde interruptum formantia. *Bractaeae* lanceolatae, 1–1.5 mm. longae. *Calyx* breviter tubulosus, vix glandulosus, 13-nervosus, 2–2.5 mm. longus, intus pilosus-annulatus, extus imberbis, vix bilabiatus ad medium in dentes lanceolato-subulatos rectos inaequales (binos anteriores posteriore subduplo longiores) obliquiter fissus. *Corolla* 6 mm. longa, albida, extus pubescens, ad $\frac{2}{3}$ bilabiata, tubo supra medium ampliato ; labium superius late ovatum, retusum ; labium inferius trilobatum, lilacino-maculatum, superius subaequans, 3.5–4.0 mm. latum, lobis lateralibus obtusissime oblongo-ovatis lobo mediano late cochleare 1.5 mm. longo vix retuso sub-breviori-

bus. *Nux* vix 1 mm. longa, latitudine subduplo longior, papillis oblongis superne munita, fusca, apice acuta apiculata.—Floret Aug.

Prov. Mersin, distr. Gülnar (Cilicia Trachea) : Kizilyokuş D. near Bozağaç (S. of Gülnar), flat and sloping limestone rocks, stems simple or few-branched, erect, fl. whitish with lilac spots on lower lip, 20 Aug. 1949, *Davis 16356* (*typus in Herb. Kew.*).

M. dolichodonta is of considerable geographical interest. On account of its calyx-shape, it appears to be most closely related to *M. pulegium* Benth., known only from Eastern Europe and the North Balkans. From *M. pulegium* it can be distinguished at a glance by its dense, short, grey indumentum and short-petioled, entire leaves. From the Balkan *M. dalmatica* Benth. it is further distinguished by the ring of hairs inside the calyx. *M. dalmatica* should perhaps include *M. bulgarica* (Vel.) Hayek as a geographical race.

In its short grey indumentum *M. dolichodonta* resembles *M. fruticosa* (L.) Druce, *sensu lato* (see below), but differs not only in its broader leaves with much shorter petioles, and in its longer lanceolate bracts, but also in the very different form of its oblique, long-toothed calyx which finds no counterpart in any West Asiatic species of *Micromeria*.

The new species was one of four (including *Sideritis brevidens* Davis described below) collected when the post-bus mercifully broke down on the road between Anamur and Silifke. The area would surely repay more leisurely exploration.

***Micromeria fruticosa* (L.) Druce** in Rep. Bot. Exch. Cl. Brit. Isles **3**, 421 (1914), *sensu lato*.

The Iberian *M. fruticosa* (L.) Druce (*M. marifolia* Benth., *pro parte occidentale*) so closely resembles some N. Anatolian specimens of *M. serpyllifolia* M.B. *s. stricto* that I have reduced the latter to a subspecies of *M. fruticosa*. This has led me to assign similar rank to *M. barbata* Boiss. et Kotschy (reduced by Boissier in *Flora Orientalis* to a variety of *M. serpyllifolia*), and also to the S. Anatolian race previously included in *M. serpyllifolia s. stricto*, but distinguished here as *M. fruticosa* subsp. *brachycalyx* Davis.

The distribution of *S. fruticosa s. lato* is peculiar : subsp. *fruticosa* grows in the Iberian Peninsula and N. Italy ; subsp. *serpyllifolia* jumps from the Crimea and N.E. Anatolia to Albania ; subsp. *brachycalyx*, equally disrupted, is found at lower latitudes than the latter, being a native of S. Anatolia and Sicily ; and subsp. *barbata*, still further south, is endemic to Lebanon and Palestine. Such a distribution suggests fragmentation of a once more continuous area, and it would seem that the species is a fairly old one. The four subspecies, regarded as entities, show an increase in the bearding of the calyx from North to South.

The records cited below are only of specimens examined. I have seen no material of the plant described as *M. marifolia* Benth. var. *italica* Huter, endemic to Manfredonia in Italy, and have therefore omitted it from my key to the races of *M. fruticosa*.

subsp. ***fruticosa*** (*Melissa fruticosa* L., Sp. Pl. 593 : 1753. *Micromeria marifolia* Benth., Lab. 382 : 1834, *ex parte ad specimina lusitanica et hispanica*. *Satureia fruticosa* (L.) Bég. var. *typica* Fiori, Nuova Fl. Analit. Ital. **2**, 455 : 1926.)

Indumentum canescens. *Caules* 30–50 cm. alti, ramosi. *Lamina* 0·8–

1.3 cm. longa, latitudine circ. 2.5-3-plo longior, pilis brevissimis appressissimis puncta haud occultantibus. *Cymae* 7-15-florae, inter se remotiusculae, racemum interruptum formantes. *Calyx* subconico-cylindricus, statu florifero 2-2.5 mm. longus, ad $\frac{1}{2}$ in dentes fissus pilis appressissimis vestitus, fauce barbatus. *Nuculae* apice obtusiusculae.

SPAIN. Valencia : Sierra de Espedan, 1500 m., *Reverchon* 686 ; in fiss. rup. ad Valentiam, 1886, *Pau* ; ad muros theatri antiqui Saguntini prope Murviedro copiose, *Willkomm* 486. Espagne, 1818, *Dufour* (*forma calyce faucibus sparse barbatulo*).

PORTUGAL. Lisbon, 1832, *Martius*.

This subspecies (as *Satureia fruticosa* (L.) Bég. var. *typica* Fiori) has also been recorded by Fiori (*l.c. supra*) from Trieste in N. Italy.

subsp. **serpyllifolia** (M.B.) Davis, comb. et stat. nov. (*Nepeta serpyllifolia* M.B., Fl. Taurico-Caucasia, 2, 40 (1808). *Micromeria serpyllifolia* (M.B.) Boiss., Fl. Cr. 4, 547 : 1879, *solum ad plantas ex Crimea*.)

Indumentum canum. *Caules* 15-40 cm. alti, ramosi. *Lamina* (8) 10-15 mm. longa, latitudine circ. 2-2.5-plo longior, subtus pilis densis puncta occultantibus. *Cymae* 7-15-florae, inter se subremotae, racemum interruptum formantes. *Calyx* obconico-cylindricus, statu florifero 2-2.75 mm. longus, ad $\frac{1}{2}$ - $\frac{1}{4}$ in dentes fissus, pilis appressissimis vestitus, fauce haud vel sparsissime barbatus. *Nuculae* apice obtusiusculae.

CRIMEA. Tauria, *Ledebour*.

N.E. ANATOLIA. Armenia, *Calvert & J. Zohrab* 751. Erzerum, *M. Zorab*. Kozan Ormanlari [Prov. Kars?], *J. Karakan* 347.

ALBANIA (sine loco), *Grisebach*.

I have not seen Bieberstein's Crimean type of this plant, only Ledebour's gathering from the same area. As the latter is fragmentary, I have drawn up the description mainly from Turkish material.

subsp. **barbata** (Boiss. et Kotschy) Davis, comb. et stat. nov. (*Micromeria barbata* Boiss. et Kotschy in Boiss., *Diagn. Ser* 2 (4) 14 : 1859.)

Indumentum valde canum. *Caules* 30-60 cm. alti, divaricato-ramosi. *Lamina* 0.8-1.5 mm. longa, latitudine 2-plo longior, subtus vix punctata. *Cymae* 7-30-florae, superiores inter se subcongestae capitulum ovatum formantes. *Calyx* obconico-cylindricus, 2-2.75 longus ad $\frac{1}{2}$ in dentes fissus, fauce valde barbatus, pilis subappressis praeditus. *Nuculae* apice subapiculatae.

LEBANON. Ad Bscherre et circa Cedretum, *Kotschy* 342. Bischmette [Bscherre?], *Ehrenberg* 111. Saida, 30 Aug. 1853, *Blanche*. "Syria", *Hooker & Hanbury*.

PALESTINE. Mt. Tabor, *Gaillardot* 726. Nazareth, *Meyers & Dinsmore* 4816 ; *ibid.*, *Bové* 420 ; *ibid.*, *Davis*. Emmaus (near Jerusalem), *Meyers & Dinsmore* 2816b ; *ibid.*, *Meyers & Dinsmore* 1847. El Bussah, 1863-4, *Lowne*.

subsp. **brachycalyx** P. H. Davis, subsp. nov. (*Micromeria serpyllifolia* (M.B.) Boiss., Fl. Or. 4, 547 : 1879, *solum ex monte Tauro*.)

A subsp. *fruticosa* lamina foliorum subtus vix evidenter punctata, calyce brevior turbinate-obconico fauce barbato, nuculis apice subapiculatis differt.

Indumentum valde canum. *Caules* 20–60 cm. alti, simplices vel ramosi. *Lamina* 0.8–1.5 cm. longa, latitudine 2–2.5-plo longior, subtus vix evidentur punctata. *Cymae* 7–30-florae, inter se subremotae manifeste pedunculatae et patentes, vel congestae et vix pedunculatae, racemum interruptum formantes. *Calyx* turbinato-obconicus, statu florifero 1.5–2 mm. longus, ad $\frac{1}{2}$ – $\frac{1}{4}$ in dentes fissus, pilis appressissimis vestitus, fauce barbatus. *Nuculae* apice subapiculatae.

S. ANATOLIA. Prov. Mersin/Adana (Cilicia): Portes Ciliciennes, Bal. 538 (*typus* in *Herb. Kew.*); *ibid.*, 31 Aug. 1949, Davis 16469; Göllek Gale, 1400 m., *Siehe* 660; Bulgar Da., ad fontes vallis Pongar Su Nedere, 1500 m., Kotschy 94, 276 & 335. Prov. Antalya, distr. Gebiz (Pisidia): Bozburun Da. near Taşlı Y., 1700 m., rocks, fl. pale lilac—used for tea, and collected for me by a peasant—26 Jul. 1949, Davis 15602. Prov. Antakya (Amanus): Seleucia, Boiss. Prov. Adana, distr. Bahçe (Amanus): Dildil Da., above Atlik Y., 2100 m., very rare, fl. white with mauve spotting on lower lip, 27 Aug. 1949, Davis 16426.

SICILY. Palermo, Gandoger 294.

As circumscribed here, subsp. *brachycalyx* shows considerable variation in the density of its cymes; in the type gathering (as in the Sicilian material) the latter are many-flowered and spreading. There is also variation in the size of the corolla. But large and small corollas are not present in the same gatherings, nor are the stamens anything but well developed even in the small-flowered forms, so that this phenomenon does not appear to be due to gynodioecism. Subsp. *brachycalyx* grows at higher altitudes in the Taurus than subsp. *barbata* does in Palestine; the latter is often co-dominant on flat rock-outcrops with *Varthemia iphionoides* Boiss. et Bal.

Key to the subspecies of Micromeria fruticosa (L.) Druce.

Cymes all more or less distant, forming a subcylindrical raceme; calyx covered with very appressed hairs, at the throat naked or bearded:

Calyx bearded at the throat:

Calyx 2–2.5 mm. long, subconical-cylindrical; leaves punctate below *fruticosa*

Calyx 1.5–2 mm. long, turbinate-subconical; leaves scarcely punctate below *brachycalyx* Davis.

Calyx not bearded at the throat, or scarcely so *serpyllifolia* (M.B.) Davis.

Upper cymes congested into an ovate head; calyx covered with somewhat appressed hairs, at the throat very strongly bearded

barbata (Boiss. et Kotschy) Davis.

Micromeria graeca (L.) Benth., Lab. Gen. et Sp. 373 (1834).

Prov. Antalya, distr. Kemer (Lycia): Kesme Boğ. near Kemer, 8 Jul. 1949, 15418; Gönük, 7 Jul. 1949, 15023; Teke Da. near Ovacik, fl. ± pink, 12 Jul. 1949, 15220.

Micromeria myrtifolia Boiss. et Hohen in Boiss., Diagn. Ser. 1, (5) 19 (1844).

Prov. Antalya, distr. Kemer (Lycia): Tahtali Da. at Kuzdere Y., 8 Jul. 1949, 15139; distr. Gebiz (Pisidia), above Kuzdere (in Kozlu D.) N. of Bozburun Da., 1100–1200 m., stony slopes in *Pinus brutia* forest, 28 Jul. 1949, 15845.

Nepeta amani Post in Bull. Herb. Boiss. Ser. 1, **1**, 29 (1893).

Prov. Adana, distr. Bahçe (Amanus) : Dildil Da., between Başkoşuş Y. and Huseyin Oluk Çe., 1800 m., steep gulley, 27 Aug. 1949 16380b—collected with *N. cilicia* Boiss. var. *cilicia*. Det. e descr.

The relationship of *N. amani* Post and *N. aristata* Boiss. et Kotschy to each other and to *N. cilicia* Boiss. requires investigation.

Nepeta cadmea Boiss., Diagn. Ser. 1 (5) 21 (1844).

Prov. Antalya, distr. Kemer (Lycia) : Tahtali Da. at Kuzdere Y., 900 m., 8 Jul. 1949, 15136 ; distr. Gebiz (Pisidia), between Taşlı Y. and Kozlu D., rocky slopes, fl. white, 27 Jul. 1949, 15729. Prov. Isparta, distr. Sütçüler (Isauria) : Dedegöl Da., between Selköşe and Oruz Gaz Y., metamorphic soils, fl. white, 1 Aug. 1949, 15910.

Having collected good material of *N. cadmea* and further examined *N. italica* L. and its close allies, I feel that the specific rank of *N. cadmea* should be maintained. Although the form of the calyx-teeth and size of the whorls (used as *differentiae* by Boissier) do not hold as distinguishing characters, the long, subulate, somewhat spreading bracts mark it off from *N. italica* as circumscribed below.

Nepeta caesarea Boiss., Fl. Or. **4**, 655 (1879).

Prov. Konya, distr. Ermenek (Cilicia Trachea) : Hamitseydi Boğ., between Sarivadi and Beşkuyu, rocky slopes, fl. purplish pink, 16 Aug. 1949, 16235. Prov. Niğde, distr. Ulukışla (Cilicia) : near Alihoca at N. foot of Bulgar Da., 1200–1300 m., 3 Sept. 1949, 16520.

Nepeta cilicia Boiss. apud Benth. in DC., Prodr. **12**, 388 (1848).

Examination of fairly abundant material of this variable species has led me to recognise the varieties described below ; one of these is based on *N. pycnantha* Benth. that Boissier reduced to a synonym of *N. cilicia* Boiss., though it has since been considered a species by Briquet (in Ann. Conserv. Jard. Bot. Genève, 1898, p. 106). The precise nature of these forms is not yet clear, so that I have preferred to classify them under the non-committal term *varietas* until they can be studied in the field. They appear to occupy equiformal progressive areas with the Cilician Taurus as their centre. Intermediates have been found in Cilicia and Isauria between var. *cilicia* (the most widespread form) and var. *pycnantha* ; but on the whole these two varieties show, like the very restricted var. *brevidens*, a rather close correlation of small distinguishing characters, especially with regard to the number of flowers in the whorl, and the size, form and indumentum of the calyx, so that most gatherings can be assigned to one or other of these three varieties. I have cited below all the material that I have seen of *N. cilicia*, *sensu lato*, but unfortunately I have not been able to examine the type of var. *pisidica* (Boiss. et Heldr.) Boiss.

var. **cilicia** (*N. andrica* Boiss. et Heldr.—*forma nuculis sub-monstruosis*.)

Lamina 2–4 cm. longa, basi cordata. *Inflorescentia* 5–11 (14) cm. longa. *Verticillastra* 3–6-nata, e cymis plerumque 3–7-floris composita. *Calyx* statu florifero 7–8 (10) mm. longus, breviter hispidulus et saepe etiam papillosus, ad $\frac{1}{4}$ vel prope ad $\frac{1}{3}$ in dentes anguste triangulares subacuminatos fissus. *Corolla* 2.5–2.7 cm. longa.

ANATOLIA. Prov. Denizli, distr. Acipayam (Caria) : Boz Da. above

Geyran Y., 1500–1670 m., 16 Jul. 1947, *Davis 13392, 13420, 13436*. Prov. Antalya distr. Gebiz (Pisidia) : Bozburun Da. at Kuruca Ov., 1800 m., rocks, much grazed, fl. violet-blue, 25 Jul. 1949, *Davis 15694* ; Bozburun Da., between Taşlı Y. and Kozlu D., 1600 m., among rocks, much grazed, 27 Jul. 1949, *Davis 15767*. Prov. Antalya, distr. Alanya (Isauria) : in cacuminibus montis Gheidagh Isaurici, 1900 m., 1845, *Heldreich (typus N. andricae Boiss. et Heldr.)* Prov. Mersin/Adana (Cilicia) : in monte Tauro, *Kotschy 460 pro parte (typus in Herb. Boiss. ; isotypus in Herb. Kew. !)* ; Bulgar Magara, 2400 m., *Kotschy* ; près du défilé du Portes Ciliciennes, *Balansa 543* ; Cilicia, *Siehe 181*. Prov. Adana, distr. Bahçe (Amanus) : Dildil Da., between Başkonuş Y. and Huseyin Oluk Çe. 1800 m., steep gulley with *N. amani*, 27 Aug. 1949, *Davis 16380a* ; Dildil Da. above Atlik Y., 2000 m., 27 Aug. 1949, *Davis 16420*.

N. LEBANON. Above Sir, 1400 m., 16 June 1943, *Davis 6362* ; in declivibus supra Ehden in Cedreto "Scherbin", 1700–1800 m., 1 Jul. 1910, *Bornm. 12310*.

W. SYRIA. In cacumine Hermonis, 1846, *Boissier* ; Hermon, 1900 m., 1863–4, *B. T. Lowne* ; in fiss. rupestr. summis mont. Garbi, 1600 m. [near Zebdaini] 1855, *Kotschy 29* ; West of Ein en Sur above Bludan, 2200 m., *Davis 9878*.

var. **pycnantha** (*Benth.*) *Davis*, comb. et stat. nov. (*N. pycnantha* *Benth.* in DC. Prodr. 12, 388 : 1848.)

Lamina 3–7 cm. longa. *Inflorescentia* 10–20 cm. longa. *Verticillastra* 5–10-nata, e cymis 5–15-floris composita. *Calyx* statu florifero 9–10 mm. longus, papillosus, vix hispidulus, prope ad $\frac{1}{3}$ in dentes triangulari-lanceolatos acuminatos fissus. *Corolla* 2.5–3.0 cm. longa.

ANATOLIA. Prov. Mersin/Adana (Cilicia) : in monte Tauro, *Kotschy 460 pro parte (typus in Herb. DC., isotypus in Herb. Kew.) ibid., Kotschy 5, 7, 12, 13 ; ibid., Balansa 543* ; Burucik, Gilbe Kur, 1300 m., *E. K. Balls 1261*. Prov. Maraş : Akher Da., 1900 m., *Haradjian 1588* ; region d'Hassan Veyli, 1300–1700 m., *Haradjian 2306*.

LEBANON. Bisshere [Bscherre], *Ehrenberg 331*.

inter var. **cilicium** et var. **pycnantham** (*Benth.*) *Davis*.

ANATOLIA. Prov. Isparta, distr. Sütçüler (Isauria) : Dedegöl Da., near the cirque Aniçi, rocks, 2100 m., 2 Aug. 1949, *Davis 16064* ; Dedegöl Da. at Oruz Gaz Y., 1 Aug. 1949, *Davis 15933*. Prov. Mersin (Cilicia) : Durnas Y. uber Fundukbunar, 1600 m., *Siehe 295*.

var. **brevidens** *P. H. Davis*, var. nov.

Lamina 1.5–3 cm. longa, basi cordata vel truncata. *Inflorescentia* 4–10 cm. longa. *Verticillastra* 4–7-nata, e cymis 3–5-floris composita. *Calyx* statu florifero 7 mm. longus, hispidulus, ad $\frac{1}{4}$ – $\frac{1}{5}$ in dentes triangulares acutos fissus. *Corolla* 2.3–2.7 cm. longa.

ANATOLIA. Prov. Mersin/Adana (Cilicia) : Cilicia, *Siehe 181 (typus in Herb. Kew.)* ; Taurus, 2400 m., *Kotschy 191* ; Bulgar Da. *Kotschy 12, 111, 64 or 191* ; Bulgar Da., near Sari Tepe Y. above Alihoca, 2700 m., among rocks, fl. violet-blue, 2 Sept. 1949, *Davis 16582*.

This variety seems to grow at higher elevations than the others.

Nepeta decumbens P. H. Davis, sp. nov. (Sect. *Eunepeta* Boiss. Subsect. *Stenostegiae* Boiss.).

Species haec ut videtur affinis *N. mussini* Sprengel ex Henke et *N. phyllochlamydi* P. H. Davis; a priore indumento patentiore, caulibus abbreviatis decumbentibus, bracteis acutissimis calycis tubum aequantibus, calyce tomentosulo-hirsuto in dentes longiores angustiores acutissimos fisso, corolla fere duplo minore, tubo e calyce paulo subexserto differt; at altera habitu magis decumbente, indumento minus denso, cymis subsessilibus congestis in verticillastra inter se \pm condensata dispositis, bracteis anguste lanceolato-linearibus acutissimis, corollae tubo longiore removitur.

Radix verticalis, crassa, lignosa. *Rami* perennes lignosi, procumbentes. *Caules* floriferi decumbentes, 8–15 cm. longi, 1 mm. lati, breviter hirsuto-tomentosi, superne simplices vel subramosi, inferne turiones steriles elongatos emittentes. *Folia* breviter appresse tomentosa, \pm canescentia, petiolata; lamina triangulari-ovata, basi cordata, 10–16 mm. longa, 8–13 mm. lata, utrinque 7–9-crenata (crenis obtusis), leviter rugulosa, petiolo subduplo longior, turionum sterilius densius vestita. *Folia floralia* caulinis simillima, sed brevissime petiolata, aliquantum diminuta, verticillastris sub-breviora nisi inferiora. *Verticillastra* 2–4-nata, 1–1.5 cm. lata, infima saepe remota, superiora inter se approximata vel condensata, e cymis coarctatis 3–7-floris vix pedunculatis vix pedicellatis composita. *Bractee* angustissime lanceolato-lineares, uninerviae, angustissime membranaceo-marginatae, ciliatae, tubum calycis \pm aequantes. *Calyx* 7–8 mm. longus, tubulosus, parum curvatus, ore paulo obliquus, extus tomentosulo-hirsutus, intus glaber, ad $\frac{2}{3}$ in dentes anguste lanceolatos acutissimos rectos vix membranaceo-marginatulos fissus. *Corolla* 12–13 mm. longa, tubo subexserto; labium superius 2 mm. longum breviter bifido-retusum lobis obtusissimis; labium inferius trilobatum, lobo mediano lobulato late orbiculare supra barbatulo, 3 mm. longo, prope 4 mm. lato, lobis lateralibus brevissimis obtusissimis. *Stamina* subexserta. *Nuculae* oblongae, 1.5 mm. longae, 0.75 mm. latae, obtusissimae, dense tuberculatae, nigrae.—Floret Jul.

Prov. Mersin, distr. Anamur (Cilicia Trachea): between Çamurlu Y. and Olucak Y. (between Ermenek and Anamur), 2000 m., among rocks, decumbent, 18 Aug. 1949, Davis 16292 (*typus in Herb. Kew.*).

The material is limited, but the species is obviously a very distinct one. It holds an intermediate position, taxonomically and geographically, between *N. phyllochlamys* P. H. Davis (described below) and *N. mussini* Sprengel ex Henke. The calyx closely resembles that of *N. phyllochlamys*, but the latter's remarkable foliaceous bracts exclude it from Subsect. *Stenostegiae* in which *N. decumbens* must be placed.

N. italica L., Sp. Pl. 571 (1753), incl. *N. leucostegia* Boiss. et Heldr. in Boiss., Diagn. Ser. I (12) 62: 1853.

Prov. Antalya (distr. Lycia): Çalbali Da., near Çukur Ardiç Y., rocky slopes, 15 Jul. 1949, 15391; distr. Gebiz (Pisidia), Bozburun Da., between Taşlı Y. and Kozlu D., rocky slopes facing N., fl. white, 27 Jul. 1949, 15730. Prov. Adana, distr. Bahçe (Amanus): Dildil Da. near Atlik Y., 1700–1800 m., fl. white shaded with pale lemon yellow, 26 Aug. 1949, 16361.

I find myself unable to keep *N. leucostegia* Boiss. et Heldr. separate from *N. italica* L. Boissier's conception of *N. italica* was an unjustifiably personal one. The holotype of that species in the Linnean herbarium is intermediate between the part of the original type-series of *N. leucostegia* collected by Kotschy, and an extreme form of *N. italica* with long-acuminate bracts and calyx teeth that Boissier in his *Flora Orientalis* appears to have considered typical of that species. The Linnean specimen has lanceolate or elliptical-lanceolate bracts that are shortly spinulose-acuminate, pruinose, ciliate, appressed, and up to 1.75 mm. broad; their white membranous margin is, as in *N. leucostegia*, well-developed, being nearly as wide as the green part. The calyx-teeth are linear-lanceolate, and are *not* acuminate. There are 12 whorls on the main stem, and only the top 3 are touching; the lower ones are 2.0–3.5 cm. apart, and 17 mm. broad (excluding the corollas).

I have been unable to match the holotype of *N. italica* really closely with any specimen in the Kew Herbarium from the Orient, to which Boissier considered it confined. Fiori (*Nuova Fl. Anal. Ital.* **2**, 416 : 1926) records it from Italy, whence Linnaeus (*Sp. Pl.* 571 : 1753) believed it came; but I have seen no specimens from there.

N. italica is evidently a very variable species, and although local races undoubtedly occur and may enable it to be divided into several confluent infraspecific taxa, I am not attempting to do so here. My Pisidian gathering (15730) resembles very closely the part of the original type-series of *N. leucostegia* collected by Heldreich near Eğridir, but the latter plant is connected in Turkey by numerous intermediate forms to Boissier's conception of "typical" *N. italica*. Only on mountains that are well isolated have forms differentiated that do not usually merge into those of adjacent areas. In the Amanus and Mount Cassius, for instance, the species is represented by a race whose lanceolate bracts are almost devoid of a membranous margin and are drawn out into a long spinulose point only slightly shorter than the corolla (e.g. *Davis 16361*). A rather similar form (*Post 547, 2119*) occurs in the Lebanon, where, however, the species is very variable.

In Euboea *N. dirphyia* Heldr., and in Cyprus *N. troodi* Holmboe, may well have been derived from the polymorphic *N. italica*, owing to complete geographical isolation. They show little variation compared with *N. italica* on the mainland, which consists, like *Sideritis libanotica* Lab., of a mosaic of intergrading local races. I have, however, kept the mainland *N. cadmea* Boiss. and *N. sulfuriflora* P. H. Davis specifically distinct from the closely related *N. italica*, since I have seen no material that closely links them to the latter.

***Nepeta nuda* L. subsp. *albiflora* Gams** in Hegi, *Illustr. Fl. Mittel-Europa*, **5** (4) 2373 (1927). (*N. nuda* L. var. *albiflora* Boiss., *Fl. Or.* **4**, 663, 1879. *N. nuda* L. var. *parviflora* Benth., *Lab.* 486 : 1834.)

Prov. Antalya (Lycia) : Çalbalı Da., 2000–2100 m., fl. white, 14 Jul. 1949, 15294.

I have examined the type of *N. nuda* L. in the Linnean herbarium, and find it conspecific with the plant generally accepted as *N. pannonica* L.; the type of the latter is in Burser's herbarium, which I have not seen. Assuming that Bentham (*Lab.* 486 : 1834) was the first to unite the two

names, I have followed him in adopting *N. nuda* L. as the binomial for this species.

subsp. **glandulifera** Huber-Morath et Davis, subsp. nov.

Affinis subsp. *marrubioidi* Huber-Morath et Davis sed indumento glanduloso atque sparsiore recedit ; a subsp. *albiflora* Gams foliis latioribus insuper differt.

Caules erecti, 40–70 cm. alti, ramosi, pilis glandulosis patentibus viscoso-pubescentes. *Folia* ovata, subsessilia, basi cordata, apice valde obtusa, 3–4.5 cm. longa, 2–3.5 cm. lata, utrimque 9–13-serrato-crenata (crenis obtusis), breviter glanduloso-pubescentia, viridia. *Folia floralia* diminuta, superiora lanceolata, integra, pedunculos superantia. *Verticillastra* 7–13-nata, remota, e cymis pedunculatis densis 3–20-floris composita, in racemos cylindricos interruptos disposita. *Bracteae* anguste lineares, acutae, tubo calycis saltem duplo breviores. *Calyx* 4.5–5.0 mm. longus, parum curvatus, striatus, ore \pm obliquus, pilis brevibus curvatis glandulosis et eglandulosis breviter pubescent-hispidulus ut pedunculi et pedicelli et bracteae, fere ad medium in dentes anguste lanceolatos anguste membranaceo-marginatos 5-fissus, tubo in fructu ampliato poculiforme. *Corolla* alba, gynodioica, σ 8 mm. longa, ρ 6 mm. longa (staminibus \pm abortivis). *Nuculae* late oblongae, obtusissimae, nigrae, praesertim in parte superiore papillosae, 1.75 mm. longae, 1 mm. latae. Floret Jun.–Aug.

Prov. Mersin, distr. Anamur (Cilicia Trachea) : between Beşkuyu and Çamulu Y. (between Ermenek and Anamur), 1900 m., rocky slopes, fl. white (ρ) 17 Aug. 1949, Davis 16270 (*typus in Herb. Kew.*) ; near Çamurlu Y., 2100 m., foot of shady rocks, fl. white (σ), 17 Aug. 1949, Davis 16259 ; Prov. Konya, distr. Bozkir (Isauria) : between Konya and Bozkir, in gorge of the Çarsamba river, 74 km. S. of Konya, 1070 m., 14 Jun. 1948, A. Huber-Morath 8464, H. Reese, J. Renz.

Dr. Huber-Morath's gathering differs from mine (on which the description is based) in having larger calyces up to 8 mm. long.

The new subspecies is closely related to the densely hairy, broad-leaved plant previously known as *N. marrubioides* Boiss. et Heldr.—a later homonym of *N. marrubioides* Willd. *N. nuda* L. subsp. *glandulifera* differs from *N. marrubioides* Boiss. et Heldr. (originally described from Kara Da. in Lycaonia) only in its glandular, less thick indumentum. *N. marrubioides* Boiss. et Heldr. is connected to *N. nuda* L. subsp. *albiflora* Gams by intermediate forms, both in leaf-shape and density of indumentum. Dr. Huber-Morath and I have therefore agreed to treat both *glandulifera* and *marrubioides* as subspecies of the widespread and variable *N. nuda* L. Like subsp. *albiflora* Gams, they are both white-flowered in contrast to the typical violet-flowered form of the species that is predominantly more westerly in its distribution. Subsp. *glandulifera* is the only glandular-haired form of *N. nuda*, and appears to have a well-defined geographical area.

subsp. **marrubioides** Huber-Morath et Davis, subsp. nov. (*N. marrubioides* Boiss. et Heldr. in Boiss., Diagn. Ser. 1 (12) 67 : 1848, non Willd., Enum. Hort. Berol. 603 : 1809=*N. italica* L.)

Nepeta phyllochlamys P. H. Davis (Sect. *Eunepeta* aff. Subsect. *Macrostegiae* Boiss.).

Species haec propter bracteas foliaceas valde distincta, ut videtur affinis *N. decumbenti* P. H. Davis sed habitu minus pumilo, indumento densiore, foliis vix cordatis, foliis floralibus longius petiolatis, bractearum forma, cymis pedunculatis in verticillastra latiora subremota dispositis, tubo corollae incluso facile distinguenda.—A *N. mussini* Sprengel ex Henke foliis vix cordatis, foliis floralibus manifeste petiolatis, bracteis foliaceis, floribus minoribus, dentibus calycis longioribus angustioribus, corolla sordide lactea tubo incluso inter alia longe distat.

Planta perennis, suffrutescens, ramis decumbentibus numerosis. *Caules* floriferi ascendentes, 5–12 cm. longi, circ. 1 mm. lati, subquad-rangulares, breviter tomentosi, superne simplices, inferne turiones steriles emittentes. *Folia* breviter et appresse tomentosa, cinerea, petiolata; lamina triangulari-ovata, 10–15 mm. longa, 8–13 mm. lata, basi truncata vel etiam subcordata, apice obtusa, utrinque regulariter 8–10-crenata (crenis obtusis), leviter rugulosa, petiolo duplo longior; eae turionum sterilium minores densius vestitae. *Folia floralia* caulinis simillima sed paulo brevius petiolata, aliquantum diminuta, cymis longiora. *Verticillastra* 2–5-nata, subremota, inter se 0.5–2.5 cm. distantia, 1–2.2 cm. lata. *Cymae* 3–11-florae, pedunculis divaricatis 2–6 mm. longis, pedicellis brevissimis. *Bracteae* foliosae, forma sensim gradatae, breviter tomentosae, petiolatae; laminae petiolum subaequant, bractearum inferiorum triangulari-ovatae vel ovatae, basi ± truncatae vel etiam subcordatae, 5–7 mm. longae, subcrenatae, indistincte reticulato-nervosae, calycibus breviores, bractearum superiorum minores, ± anguste ellipticae, integrae. *Calyx* circ. 7 mm. longus, tubulosus, parum curvatus, distincte nervosus, ore aliquantum obliquus, extus molliter tomentosulo-hirsutus, intus glaber, ad $\frac{1}{3}$ – $\frac{2}{5}$ in dentes anguste lanceolatos acutos vix membranaceo-marginatulos fissus, tubo in fructu paulo ampliato. *Flores* ut videtur gynodioici. *Corolla* (♀) 9 mm. longa, extus pubescens; tubi inclusi pars angusta 5 mm. longa et 0.5 mm. lata; labium superius 2 mm. longum, lacteum, profunde retusum, lobis obtusissimis 1.5 mm. latis; labium inferius pallidissime roseo-albidum, trilobatum, lobo mediano subreniforme, 2.5 mm. longo, 4.25 mm. lato, lilacino-maculato crenulato supra barbatulo, lobis lateralibus brevissimis rotundatis. *Filamenta* in fl. ♂ 2–2.5 mm. longa, in fl. ♀ 1 mm. longa. *Nuculae* oblongae, 1.75 mm. longae, 0.75 mm. latae, obtusissimae, dense tuberculatae, nigricantes.—Floret Jun.

Prov. Antalya (Lycia): Söğüt Y. near Sivri Da. (W. of Antalya), rocky places in woods, 16 Jul. 1949, *Davis 15431* (typus in *Herb. Kew.*); distr. Kemer (Lycia), Teke Da. near Ovacik (W. of Kemer), among rocks, 1100 m., 12 Jul. 1949, *15219*, and Kesme Boğ. near Kemer, 60–100 m., rocky slope, 14 Aug. 1947, *14052* (“*Nepeta* sp. nov.,” Davis in *Kew Bull.* 1949: 404, and cult. in *Herb. Ground, Roy. Bot. Gard., Kew*, 18 Jun. 1949).

Because of its unique foliaceous bracts, the Lycian *N. phyllochlamys* does not fall readily into either of Boissier's two subsections of Sect. *Eunepeta* with tuberculate nutlets, although Subsect. *Macrostegiae* Boiss. (divided into two subsections by Briquet in Engler and Prantl, *Pflanzenf.* 4 (3a) 236: 1897) might be emended to accommodate it. However, the new species has no relatives in Subsect. *Macrostegiae*, its affinities being with *N. decumbens* P. H. Davis and *N. mussini*, both of which, on account of

their lanceolate or linear-subulate bracts, belong to Subject. *Stenostegiae* Boiss. (split into four subsections by Briquet, *l.c. supra*). The calyx of *N. decumbens* is indeed almost identical with that of *N. phyllochlamys*, suggesting that the latter, despite the remarkable form of its bracts, is most closely related to *N. decumbens* from Cilicia Trachea. *N. phyllochlamys* may have to be made the type of a new subsection.

Nepeta pilinix P. H. Davis in Kew Bull. 1949 : 402 (1949).

Prov. Antalya, distr. Gebiz (Pisidia) : Bozburun Da., N.E. side, 2000 m., between boulders in dry torrent bed, fl. white, 25 Jul. 1949, 15675. Prov. Isparta, distr. Sütçüler (Pisidia) : Dedegöl Da. above Oruz Gaz Y., screes, fl. white with a pinkish tinge, 2 Aug. 1949, 15960 ; Dedegöl Da. at Taş Oluk Y., 2100 m., fl. whitish, 2 Aug. 1949, 16065.

No. 16065 and 15676 have more slender teeth than the type, and 15676 has subcordate stem leaves, thus bringing the species still nearer to the Peloponnesian *N. camphorata* Boiss. et Heldr., from which, however, it remains clearly distinguished by the shape of its membranous-margined bracts.

Nepeta sulfuriflora P. H. Davis, sp. nov. (Sect. *Eunepeta* Benth. Subsect. *Stenostegiae* Boiss.).

Affinis *N. cadmea* Boiss. sed caulibus floriferis inferne patenter hirsutis, foliis viridioribus, bracteis brevioribus appressis tubum calycis \pm aequantibus, tubo corollae sulfureae calycum superante differt.

Planta perennis, basi lignescens, ramis primariis breviter decumbentibus. *Caules* floriferi 30–50 cm. alti, simplices vel simpliciter ramosi, erecti, quadrangulares, medio 1–1.5 mm. lati, superne et inter verticillastra pilis eglandulosis brevissimis appressis \pm canescentes, inferne papillis glandulosis et pilis longis eglandulosis patentibus hirsuti ut caules turionum sterilium. *Folia* caulium floriferorum petiolata ; lamina triangulari-ovata, 2–3.2 cm. longa, 1.3–2.4 cm. lata, subobtusata, crenata, basi cordata, pilis brevissimis eglandulosis appressis vestita, supra virescens, subtus canescens glanduloso-punctata, petiolo plerumque 2–3-plo longior ; folia turionum sterilium similia sed duplo minora, longius petiolata, papillis glandulosis et pilis longis eglandulosis hirsuta, manifestius glanduloso-punctata, \pm obtusa vel nunc abrupte acuminata. *Verticillastra* 3–11-nata, 6–25-flora (inferiora plerumque 3–4 cm. distantia, summa approximata) in spicam interruptam 2–16 cm. longam disposita, fructu 8–17 mm. lata. *Folia floralia* caulinis similia sed brevius petiolata, minus crenata, \pm acuta vel acuminata, basi truncata, calycibus longiora, superiora anguste ovata vel lanceolata, subsessilia, acutissima, calycibus breviora. *Flores* subsessiles in cymas breviter pedunculatas congestas dispositi. *Bractea* \pm numerosae, subulatae, rigidae, manifeste uninerviae, vix albo-marginatulae, tubum calycis \pm aequantes, appressae. *Calyx* statu florifero 6–6.5 mm. longus, 15-nervosus, pilis brevibus eglandulosis curvatis et papillis subsessilibus glandulosis subcanescens, parum curvatus, ore obliquus, ad medium in dentes subulatos vix albo-marginatulos fissus ; dens posterior ceteris paulo longior. *Corolla* sulfurea (saepe pallida), 12 mm. longa, extus pubescens, tubo superne curvato exserto ; labium superius 2.5 mm. longum, obcordatum ; labium inferius 6 mm. longum, lobis lateralibus brevissimis late rotundatis, lobo mediano ambitu transverse reniformi-

elliptico barbato, 3.5 mm. longo, 7 mm. lato, ad tertiam partem in lobulos anguste triangulari-oblongos obtusos 7-9-digitato. *Stamina* 2-3 mm. longa. *Nuculae* late oblongae, 1.75 mm. longae, 1 mm. lati, obtusae, subtriquetrae, tuberculatae, nigrae.—Floret Jul.—Aug.

Prov. Mersin, distr. Anamur (Cilicia Trachea) : between Beşkuyu and Çamurlu Y. (between Ermenek and Anamur), 1900 m., very local on steep rocky sides of limestone ravine, erect, fl. sulphur-yellow but often pale, 17 Aug. 1949, *Davis 16275* (*typus in Herb. Kew.*).

N. sulfuriflora is certainly as well, if not better, distinguished from the closely related white-flowered *N. cadmea* Boiss. (with a more westerly distribution) as the latter is from *N. italica* L. (including *N. leucostegia* Boiss. et Heldr.). The new species also approaches *N. italica*, especially the more typical forms, from which it differs by its greener leaves, hirsute indumentum in the lower part of the flowering stems and sterile shoots, smaller whorls, fewer bracts that are subulate and only half as long as the calyx, and sulphur (not white) corolla with the tube overtopping the calyx-teeth. Unlike *N. sulfuriflora*, the sterile shoots and the lower part of the flowering stems of *N. cadmea* (as in *N. italica*, *s. lato*) are not usually hirsute with long spreading hairs. But that form of indumentum occurs on sterile shoots in my gatherings of *N. cadmea* from N.E. of Antalya (*Davis 15136 & 15910*) ; however, the much shorter, appressed bracts of *N. sulfuriflora*, and its characteristic flower-colour (in my experience its allies are all white-flowered), warrant specific rank.

Origanum amanum *Post in Bull. Herb. Boiss. Ser. 1, 3, 161 (1895).*

Prov. Adana, distr. Bahçe (Amanus) : Dildil Da., between Başkonuş Y. and Huseyin Oluk Çe., 1800 m., on rocks in steep gulley, 27 Aug. 1949, *16390* ; Dildil Da., above Atlik Y., 2000 m., on sloping limestone rocks, 27 Aug. 1949, *16439*.

The very rare *O. amanum*, undoubtedly the most spectacular species in its genus, was collected on the same mountain by Haradjian. In my material the corolla measures up to 3.4 cm. in length. A plant sent home by air has become established in cultivation.

Origanum x dolichosiphon *P. H. Davis, hybr. nov. (= O. [Sect. Amaracus (Gled.) Benth. emend. Boiss.] amanum Post x O. [Sect. Euoriganum Vogel] laevigatum Boiss.)*

Ab *O. amano* *Post* foliis brevissime petiolatis minus prominenter nervosis basi haud cordatis, spicis in pedunculos breves binos in axillis foliorum superiorum dispositis inflorescentiam ambitu anguste oblongam formantibus, bracteis 2-3-plo minoribus angustius ellipticis, floribus minoribus, calyce fauce barbato, labio superiore in dentes lanceolatos profundius fisso, corollae tubo minus exserto, limbo minore differt.

Ab *O. laevigato* *Boiss.* caulibus brevioribus inferne breviter hispidulis superne haud panniculato-corymbosis, foliis latioribus ovatis basi abrupte truncatis brevius petiolatis margine scabro-ciliatis, bracteis duplo majoribus textura tenuioribus proportione paulo latioribus calyces occultantibus, calyce paulo majore bilabiato indistinctius nervoso fauce minus barbato, dentibus longioribus lanceolatis ciliatis, corollae tubo graciliore, staminibus subsessilibus recedit.

Calyx 6 mm. longus, ad $\frac{2}{3}$ vel paulo ultra bilabiatus. Corolla 16 mm. longa, purpureo-rosea. Grana pollinis et ovula abortiva.—Floret Aug.

Prov. Adana, distr. Bahçe (Amanus) : Dildil Da., in steep gully between Başkonuş Y. and Huseyin Oluk Çe., 1800 m., fl. purplish pink, *O. amanum* and *O. laevigatum* both found nearby, 27 Aug. 1949, Davis 16412 (*typus in Herb. Kew.*).

This hybrid, the first indisputable cross between Sect. *Amaracus* and Sect. *Euoriganum*, is between species that are morphologically extremely dissimilar. A colony of about six plants was found, on a boulder in the bed of a gully. As the hybrid is evidently sterile, and has a somewhat repent habit, it seems probable that the colony consisted of a single clone. *O. amanum* favours altitudes above 1800 m., but is very local. *O. laevigatum* is found chiefly below 1500 m., but occurs sparsely at 1800 m. on southern exposures. The hybrid was found at the point of overlap between the two species. Lower down, *O. laevigatum* crosses with *O. syriacum* L. to form *O. x symeonis* Mouterde (*vide infra*).

***Origanum dubium* Boiss., Fl. Or. 4, 553 (1879).**

Prov. Mersin, distr. Anamur (Cilicia Trachea) : Olucak Y., between Ermenek and Anamur, 1400 m., 18 Aug. 1949, 1633*b* ; *ibid.*, 1500 m., S. slopes, fl. white 18 Aug. 1949, 1633*a* ; Kükür (above Anamur), 900 m., in *Pinus brutia*-*Quercus sp.* woods, 18 Aug. 1949, 16341. Prov. Antalya, distr. Alanya (Pamphylia/Isauria) : between Kozlu D. and Kargı Ça. (N.E. of Alanya), 1000 m., 26 Aug. 1947, 14274 (" *O. majoranoides* Willd.", Davis in Kew Bull. 1949 : 408).—Det. Burt & Davis.

Mr. B. L. Burt is cultivating *O. dubium* Boiss. and *O. majoranoides* Willd. in the Herbarium Ground at Kew, and finds them readily distinguishable ; nevertheless, there is a certain degree of overlap in the abundant herbarium material of these plants from Cyprus. Re-determination of Davis 14247 shows that *O. majoranoides* is still unknown as a wild plant outside Cyprus. Material of *O. majoranoides* from Spain (where it is believed to be a naturalised alien) has narrower leaves than in the Cyprus forms.

***Origanum gracile* C. Koch in Linn. 21, 661 (1848). (*O. viride* (Boiss.) Hal. in Denkschr. Akad. Wiss. Wien, 61, 481 : 1894.)**

Prov. Isparta, distr. Sütçüler (Pisidia) : between Tota Beyli Y. (on Kuyucuk Da.) and Daribükü, 900-1400 m., metamorphic soils, fl. white, 30 Jul. 1949, 15893 ; Dedegöl Da., between Selköşe and Oruz Gaz Y., 1300 m., metamorphic slopes, fl. white, 1 Aug. 1949, 15930. Prov. Konya, distr. Beyşehir (Isauria) : between Hoyran and Kurucaova, in ditches, fl. white, 4 Aug. 1949, 16087.

I am by no means certain that specific rank should be accorded to *O. gracile* (the name taken up by Handel-Mazzetti in Ann. K. K. Nat. Hofmus, Wien, 27, 420 : 1913), but if *O. heracleoticum* is to be maintained as a species it seems logical that *O. gracile* should be given equivalent rank. They might both be considered subspecies of *O. vulgare* L. The outline of the inflorescence and the flower-colour are important characters in this critical group that has long been in need of revision. In the Levant *O. gracile* and *O. heracleoticum* are often difficult to distinguish from each other, especially in Northern Iraq, where intermediates occur. In *O. heracleoticum* and *O. gracile* the presence (or absence) of glands on the bracts (often taken as a "key" character) is not always correlated with the shape of the inflorescence characteristic for each species.

My specimens of *O. gracile* are the only ones that I have seen from the Southern Anatolia ; but there is material in the Kew Herbarium from Amasya and Armenia.

***Origanum heracleoticum* L.**, Sp. Pl. 589 (1753).

Prov. Adana, distr. Karaisah (Cilicia) : Bulgar Da., between Pozanti and Meydan Y., 1500 m., abundant on the hillsides, fl. white, 1 Sept. 1949, 16588.

Specimens from the Taurus usually have larger bracts than one finds in European material. For remarks on the affinities of this species with *O. gracile* C. Koch, see the note on the latter.

***Origanum laevigatum* Boiss.** in Ann. Sc. Nat. Bot. Ser. 4, 2, 252 (1854).

Prov. Adana, distr. Bahçe (Amanus) : Dildil Da., between Başkonuş Y. and Huseyin Oluk Çe., 1500 m., 27 Aug. 1949, 16391 ; *ibid.*, 1800 m., rare, 16381 ; Dildil Da. above Haruniye, 400–500 m., in maquis (*Quercus—Phylleria*) and open woodland (*Ostrya carpinifolia*, etc.), many-stemmed, fl. purple, 26 Aug. 1949, 16371.

On Dildil Dağ this very distinctive species ascends to 1800 m. on southern exposures, but is rare above 1500 m. : on northern slopes it becomes very scarce above 1300 m. Hitherto recorded only from the Amanus region, a specimen has recently been received at Kew collected near Larnaka in Cyprus by Haradjian (1013). When travelling from Mersin to Pozanti in the Cilician Taurus, I saw from the train an *Origanum* that appeared to be *O. laevigatum*.

***Origanum leptocladum* Boiss.**, Fl. Or. 4, 548 (1879).

Prov. Konya, distr. Ermenek (Isauria) : between Ermenek and Balkusan D., 1500 m., on marly hillsides, large bushy plants, fl. purple, 14 Aug. 1949, 16194 ; (Cilicia Trachea) Sarivadi, 1300 m., 16 Aug. 1949, 16237.

These two localities are on opposite sides of the Göksu valley.

***Origanum micranthum* Vogel** in Linn. 15, 77 (1814).

Prov. Adana, distr. Karaisah (Cilicia) : Bulgar Da., between Pozanti and Meydan Y., 1500 m., dry gully, 1 Sept. 1949, 16586 (*forma foliis angustioribus minus obtusis distinctius nervosis a typo differt*).

This small gathering, quoted under *O. micranthum* Vogel because its calyx is typical for that species, may possibly be the product of hybridisation between *O. micranthum* and *O. heracleoticum* L. that grew beside it. Another gathering from the same place (16586) appears to be a hybrid between these two species, though, as the calyx resembles that of *O. heracleoticum*, even that may be a depauperate form of the latter, differing in its dwarfer stature, shorter spikelets, smaller leaves and shorter bracts that are more pilose ; fully formed nutlets suggest that it is fertile. Both numbers were collected in a very arid locality and were grazed. I did not collect any typical *O. micranthum*, though *O. heracleoticum* was abundant. It seems possible that a hybrid swarm is involved.

***Origanum minutiflorum* Schwarz et Davis** apud Davis in Kew Bull. 1949 : 408 (1949).

Prov. Antalya, distr. Lycia : near Çalbalı Da., between Kar Çukuru and Fesliken Y., 14 Jul. 1949, 15402 ; distr. Gebiz (Pisidia) : Bozburun Da., between Boğaz Ağzi and Tozlu Çukur Y., 24 Jul. 1949, 15509, and at Taşlı Y., 1700 m., open rocky slopes, fl. white, 27 Aug. 1949, 15773.

The two gatherings from Bozburun Dağ approach *O. bilgeri* P. H. Davis (Kew Bull. 1949 : 406) in having rather broader and larger leaves, and a slightly denser indumentum than in the type of *O. minutiflorum*. When more material becomes available, it will be necessary to review the status of these two species in relation to each other and to *O. micranthum* Vogel.

Origanum onites L., Sp. Pl. 590 (1753).

Prov. Antalya, distr. Kemer (Lycia) : Gönük, fl. white, 7 Aug. 1949, 15012 ; Tahtalı Da., near Kuzdere Y., 8 Jul. 1949, 15133 ; distr. Gebiz (Pisidia) : Bozburun Da., near Pinargözü Y., on rocks, fl. white, 23 Jul. 1949, 15522.

Origanum saccatum P. H. Davis in Kew Bull. 1949 : 409 (1949).

Prov. Isparta, distr. Sütçüler (Pisidia) : Dedegöl Da., between Daribükü and Selköşe, 30 Jul. 1949, 15857 (*alabastra*).

Origanum sipyleum L., Sp. Pl. 589 (1753).

Prov. Konya, distr. Beyşehir (Isauria) ; Sarıköy near Beyşehir, in steppe, 5 Aug. 1949, 16122.

Origanum x symeonis Mouterde in Ann. Fac. Médec. Beyrouth, 6 (reimpr.) 3 (1935). (= *O. laevigatum* Boiss. x *O. syriacum* L.)

Prov. Adana, distr. Bahçe (Amanus) : Dildil Da. near Gökçayır, in limestone ravine with *O. laevigatum* and *O. syriacum*, fl. purplish lilac, scattered sparsely among the parents, 27 Aug. 1949, 16417 (*forma dentibus calycis ciliatis a typo [e descr.] divergit ; etiam nonnulla grana pollinis et ovula fertilia ut videntur, nucas formantia*).

Origanum syriacum L., Sp. Pl. 590 (1753).

Prov. Adana, distr. Bahçe (Amanus) : Gökçayır at foot of Dildil Da., 600 m., with *O. laevigatum* in gully, fl. white, 27 Aug. 1949, 16415.

Phlomis armeniaca Willd., Sp. Pl. 3, 119 (1800). (*P. linearis* Boiss. et Bal. subsp. *anticragi* P. H. Davis in Kew Bull. 1949 : 412.)

Prov. Antalya (Lycia) : Söğüt Cuması Y. between Teke Da. and Çalbalı Da., 1400 m., 13 Jul. 1949, 15242a & b ; Çalbalı Da. near Çukur Ardiç Y., 1700 m., 15 Jul. 1949, 15390 ; distr. Gebiz (Pisidia), Bozburun Da., between Boğaz Ağzi and Tozlu Çukur Y., 24 Jul. 1949, 15577.

Phlomis chimerae de Boissieu in Bull. Soc. Bot. France, 43, 290 (1896).

Prov. Antalya, distr. Kemer (Lycia) : Gönük, below 100 m., rocky places in the gorge, 7 Jul. 1949, 15016.

In Kew Bull. 1949 : 411, I omitted to state that the identification of Tengwall's gathering of this rare species was due to Dr. Huber-Morath (*in litt.*). Plants of *P. chimerae* are being raised from seed collected at Kesme Boğaz near Kemer in 1949.

Phlomis grandiflora H. S. Thompson in Ann. Bot. (London) 19, 441 (1905).

Prov. Antalya (Pisidia) : Termessus, 600 m., 19 Jul. 1949, 15450 ; distr. Kemer (Lycia) : Teke Da. near Ovacik, 1100-1200 m., 12 Jul. 1949, 15182 ; Tahtali Da. at Kuzdere Y., 900 m., 8 Jul. 1949, 15155 ; distr. Gebiz (Pisidia), Bozburun Da. at Pinargözü Y., 600 m., 22 Jul. 1949, 15488. Prov. Konya, distr. Beyşehir (Isauria) : Kurucaova at the foot of Dedegöl Da., limestone hillsides with S. exposure, 4 Aug. 1949, 16091.—One of the commonest Labiates between Finike and the lake of Beyşehir.

Phlomis leucophracta Davis et Huber-Morath, sp. nov. (Sect. *Euphlomis* Benth. Subsect. *Dendrophlomis* Benth. Ser. *Angustebracteatae* Vierh.).

Affinis *P. viscosae* Poiret (incl. *P. bourgaei* Boiss.) et *P. longifoliae* Boiss. et Blanche sed lamina foliorum albo- (vel aureo-) marginata, bracteis semper angustissime lanceolatis fere e basi sensim angustatis, dentibus calycis longioribus (6-13 mm. longis), corolla bicolore aurea galea ferrugineo-suffusa inter alia facile distinguenda. Indumentum aliquantum glanduliferum.

Frutex habitu *P. viscosae* Poiret, 1-1.5 m. altus et latus, divaricato-ramosus, ramis crassis cortice in senectute longitudinaliter fisso. *Folia* petiolata ; lamina triangulari-lanceolata, apice obtusa, basi cordata, marginem leviter crenatum saltem aestate subinvolutum album (vel aureum) exhibens, matura (ea turionum sterilius minor, densius vestita) 10-12 cm. longa, basi 2, 5-3.5 cm. lata, pilis subaequaliter stellatis (rarius simplicibus) glandulosis et eglandulosis oblecta, supra breviter substellato-tomentosa virescens \pm viscidula, subtus minus glandulifera densissime et breviter stellato-tomentosa albicans (vel aurea) vix viscidula ; petiolus 4-4.5 cm. longus, propter pilos valde inaequaliter stellatos (glandulosos et eglandulosos) viscidulo-stellato-villosus. *Caulis* floriferus terminalis simplex vel subramosus, 25-35 cm. longus, una cum axillaribus brevioribus subcandellabrum saepe formans. *Folia floralia* brevius petiolata, inferiora basi subcordata, superiora brevissime petiolata basi truncata vel late cuneata. *Verticillastra* 1-3-nata, in fructu 4-4.5 cm. lata, 6-11 cm. inter se distantia. *Bractee* angustissime lanceolatae, fere e basi ad apicem aristatum sensim angustatae, 17-22 mm. longae, 1.5-2.0 mm. latae, tubo calycis sub-longiores, inferne appressae, superne \pm patentem, breviter viscoso-stellato-tomentosae. *Calyx* (in fructu) 2.3-2.8 cm. longus, inaequaliter 5-dentatus, pilis stellatis glanduliferis et eglanduliferis in toto breviter viscoso-stellato-tomentosus ; tubus anguste infundibularis, 14-16 mm. longus, fauce 7 mm. latus ; dentes parte basali truncati etiam obcordati, in subulas longas vix vel valde patentem abeuntes, bini 10-12 mm. longi, caeteri breviores 5-9 mm. longi. *Corolla* bicolor, 32 mm. longa, paulo infra medium bilabiata ; tubus aureus, 14 mm. longus, in parte inferiore 2 mm. latus, in parte superiore ampliatus 4.5 mm. latus ; galea ex toto intense ferrugineo-suffusa, 18 mm. longa, extus brevissime stellata et glandulifera, apice leviter et obtusissime trilobata, intus barbata ; labium inferius aureum, 16 mm. longum et latum, trilobatum, subtus brevissime substellatum, lobo mediano late orbiculare retuso, 8 mm. longo, 11 mm. lato (basi 7 mm. lato angustato), lobis lateralibus triangularibus (sed ad marginem anteriorem rotundatis) breviter et obtuse acuminatis. *Nuculae* ovato-oblongae, 5 mm. longae, 2 mm. latae, subtriquetrae, obtusae, laeves, fuscae.—Floret Jun.

rupestris, are distinct in being pinnatisect (or pinnately divided) to the base. The leaves of *S. variegata* may be divided to the base, but Davis's gathering—rupestral plant like *S. rupestris*—is further removed from that species, notably in habit. In addition there are the differences noted above which apply to both *S. rupestris* and *S. variegata*—glabry and appendix-shape.

The new variety agrees more closely with material of *S. variegata* from Persia, Armenia and Asia Minor than with Palestine and Syrian specimens.

Scrophularia Scopolii [Hoppe ex] Pers., Syn. 2, 160 (1807) var. **longirostrata** Heywood, var. nov.

Folia simplicia, breviter petiolata, ovata vel ovato-lanceolata, ad basin truncata, vel cuneata, concoloria, venis anastomosantibus subtus prominentibus; inferiora usque 10 cm. longa, 4 cm. lata, superiora diminuta, dentibus manifeste apiculatis inciso-crenata. Capsula glabra, ad basin ovato-globosa, apice longe attenuata, rostrata. Appendix et flores ut in forma typica.

Prov. Antalya, distr. Alanya (Isauria): Han Boğaz forest near Geyik Da. in *Abietum*, 1,580 m., 30 Sept., 1947, Davis 14710 (*holotypus* in Herb. Kew.; *isotypus* in Herb. Edin.).

When known only from fruiting material, it was at first thought that this was a new species, but plants raised from Davis's seed at the Royal Botanic Garden, Edinburgh, have emphasised its affinity with *S. Scopolii* (itself ready polymorphic), of which I now consider it a new variety.

Capsules approaching var. *longirostrata* in length of beak are found in specimens of *S. Scopolii* collected by Kotschy in the Taurus (1836, No. 377). The plants have larger leaves with fewer dentations, but may be placed here.

Scrophularia Scopolii [Hoppe ex] Pers. *forma*.

Prov. Antalya, distr. Alanya (Isauria): Ak Da., S. of Geyik Da., in shady places by little lake, 2,200 m., 28 Aug. 1947, Davis 14366.

On Ak Dağ, a little to the south of the type locality of *S. Scopolii* var. *longirostrata*, and at the much higher altitude of 2,200 m. by a tarn used by shepherds to water their goats, Davis collected a *Scrophularia* related to *S. Scopolii*. The plants had been goat-eaten but a good, although somewhat dwarfed, specimen was collected in flower. I can refer it to no published variety of *S. Scopolii*, but as the material is very limited and perhaps not typical I have refrained from describing it as new. It is a glandular pubescent annual or biennial, c. 20 cm. tall, with shortly petiolate triangular-ovate leaves which are grossly and irregularly incised-dentate. The cymes are 4-flowered, the pedicels densely glandular, the corolla brownish-green, 8 mm. long with included or subexserted stamens. The appendix is reniform with slightly divaricating lobes; the capsules (immature) ovate-globular, one and a half times as long as the calyx. The plants show a superficial resemblance to *S. Hajariana* Parsa (*typus* in Herb. Kew.) from Iran, but there is no close affinity.

Scrophularia aff. **S. subaphyllae** Boiss., Diagn. Pl. Or. Ser. 1 (7) 41 (1846).

Prov. Antalya, distr. Kemer (Lycia): Tahtali Da., 2,000–2,200 m., N. scree, perennial, very twiggy, flowers brownish-green, 10 July 1949, Davis 15063; *id.* 16 Aug. 1947, Davis 14118 (*fruct.*).

This gathering is probably of a new species related to *S. subaphylla* from

which it differs by its larger reniform appendix, brownish-green corolla, and more divaricately branched habit. *S. striata* Boiss., which resembles it, distinguished by its less divaricate-branched habit, more striate stems, and cymes with 9-5 very shortly pedicellate flowers. It approaches *S. candelabrum* Heywood in its more or less candelabrum-branching habit, but it diverges in its more slender, fragile and numerous stems, smaller more regularly divided leaves, cymes reduced to 1 or 2 flowers, and brownish-green corolla.

Scrophularia umbrosa Dumort., Fl. Belge, 37 (1827) ut sp. nov. [*S. alba* Gilib., Fl. Lithuan. 2, 127 (1781), *nomen illegitimum*].

Prov. Izmir, distr. Ödemiş: Boz Da. (Tmolus Lydiae), shady stream bank, 1,300 m., 16 Aug. 1950, Davis 18234 and Heywood. *Prov. Muğla, distr. Fethiye (Lycia)*: Girdev Da. at Bel Y., by spring, 7 Aug. 1947, Davis 13888.

No. 18234 is more or less typical, but the calyx lobes are rather narrower than usual, and the appendix is of a curious shape—much broader than long with the upper margin lobed-undulate. Boissier notes the appendix shape as variable.

For a summary of the nomenclature of this species *vide*: Hylander, Nomenklatorische und systematische Studien über nordische Gefäßpflanzen in Uppsala Univ. Arsskr. 7, 280 (1945).

Scrophularia umbrosoides Heywood, sp. nov. (Sect. *Scorodonia* Don).

A *S. umbrosa* Dumort. foliis basi truncatis (neque rotundatis nec subcordatis nec cordatis), inflorescentia multo magis divaricata, cymis paucifloris, pedicellis multum longioribus, appendice late orbiculata integre divergit.

Planta glaberrima (pedicellis exceptis). Caulis quadrangularis, acute alatus, purpurascens, c. 1.5 m. altus, laxe ramosus, foliatus, in inflorescentiam longam laxam abiens. Folia simplicia petiolata, opposita; inferiora petiolis subalata 3.5 cm. longis suffulta, lamina lanceolata vel oblongo-lanceolata 9-10 cm. longa 4 cm. (parte maxima) lata, basi ambitu truncata, textura tenuis, concoloris nervis infra prominentibus valde anastomosantibus, dentibus 20-30 regulariter superne diminutis submucronatis infimis manifeste reflexis crenate dentata; superiora breviter petiolata, lamina apice attenuata, acuta. Folia floralia lineari-lanceolata, summa linearia. Cymae irregulariter divaricatae 5-multi-florae, pedunculis glabris (inferioribus 2.5-4.0 cm. longis) suffulta. Bractae lineares aut subulatae pedicellis breviores. Pedicelli glanduloso-calycibus usque 7-plo longiores, bracteolis subulatis suffulti. Calycis lacinae glabrae ovatae, 2.5 mm. longae, margine serrato-dentato albo. Corolla glabra, fusco-virens (in sicco) 6 mm. longa, 3 mm. lata, lobis superioribus ceteris sequilongioribus. Stamina vix exserta. Appendix late ovato-circularis (transverse latior) integra, basi vix subcordata. Capsula ovata, glabra, 5-mm. longa, breviter apiculata, calyce 2-3-plo longior.

Prov. Denizli, distr. Acipayam (Caria): Boz Da., near Geyran Y., by shady stream, 1,300 m., 16 July 1947, Davis 13356 (*holotypus in Herb. Kew.*; *isotypus in Herb. Edin.*).

The new species is probably most closely related to *S. umbrosa* Dumort. with which it agrees in habit and appearance, and in the winged stems. The development of the base of the lamina is a distinctive feature: the proximal teeth are markedly reflexed, giving a winged appearance almost suggesting

obovate base. In inflorescence the new species differs from *S. umbrosa* in its longer spreading peduncles (of the cymes), in the individual pedicels which are six times as long as the calyx, and in its looser fewer-flowered cymes. The appendix of *S. umbrosa* is variable, normally broader than long, cordate-bilobed with divaricating lobes, but in *S. umbrosoides* it is of a type not observed in *S. umbrosa*—broadly ovate-orbicular, entire, and scarcely cordate at the base.

S. umbrosoides agrees with *S. divaricata* Led. in having divaricating cymes, but this feature is even more developed than in that species. *S. divaricata* differs in its obtusely winged stem which is "crispule villosus," in its membranaceous undulate leaves which are cordate at the base, and in its orbiculate deeply margined calyx-segments.

S. umbrosoides is known only from the type-gathering: it was collected by Davis in a shaded woodland stream in an otherwise dry locality.

***Strophularia xanthoglossa* Boiss., Diagn. Pl. Or. Ser. 1 (12) 38 (1853).**

Prov. Ankara: hills between Kayaş and Kubrus, 6 July 1947, Davis 117.

***Strophularia* aff. *xanthoglossae* Boiss.**

Prov. Denizli, distr. Acipayam (Caria): Monastir Ormani between Acipayam and Abbas, open places near wadi bed in *Pinus Brutia* forest, 18 July 1947, Davis 13471.

Collection in fruit: stout virgate plant with woody base and many-flowered cymes. The flowers and fruits appear to be very small. Probably a form of *S. xanthoglossa*, but as there are no corollas, few fruits and few leaves it is impossible to define more precisely. There are also affinities with *S. canina* L. (in a different appendix group).

***Strophularia xylorrhiza* Boiss. et Haussk. in Boiss., Fl. Or. 4, 406 (1897).**

Prov. Konya, distr. Bozkir (Isauria): Bozkir vadisi, cliffs, perennial, 1,100 m., Sept. 1947, Davis 16619 (*fruct.*).

The gathering agrees well with *Kotschy* 100 (sub *S. Pinardi* orig. det. Boiss.) from the Cilician Taurus, cited by Boissier in *Fl. Orientalis*.

***Strophularia* aff. *xylorrhizae* Boiss. et Haussk.**

Prov. Muğla, distr. Fethiye (Lycia): Telmessus, rocks, 28 July 1947, Davis 1703 (*fruct.*).

***Strophularia* sp.**

Prov. Muğla (Fethiye): Baba Da. above Akbel Y., c. 2,000 m., 30 July 1947, Davis 13654.

There are no flowers and only fragmentary leaves.

***Strophularia* sp. (Sect. *Tomiophyllum* Benth.).**

Prov. Antalya, distr. Gebiz (Pisidia): Bozburun Da., above Tozlu Çukur Y., conglomerate cliff, perennial, woody base, 1,900–2,100 m., 27 July 1949, Davis 15605.

Collection in fruit which has not been matched.

Appended below is a key to the biennial species of the Sect. *Ceramant* Reichb. of which I have seen material.

- A. Cymes erect or ascending, \pm lax and elongate:
 - B. Capsules glabrous:
 - C. Calyx lobes ovate-oblong, obtuse, glandular *S. vernae*
 - CC. Calyx lobes ovate-lanceolate, acute or subacute, glabrous *S. praeterita*
 - BB. Capsules glandular or glandular-tomentose:
 - D. Plants glabrous *S. lunariifolia*
 - DD. Plants papillose-glandular, hirsute, lanate or hispid:
 - E. Inflorescence of subsessile cymes forming a dense thyrses *S. chrysanthifolia*
 - EE. Inflorescence of longly pedunculate cymes arising from the axils of most leaves, forming a lax thyrses:
 - F. Plants procumbent or ascendant *S. Bornmuelleri*
 - FF. Plants erect:
 - G. Flowers very large, up to 12 mm. long; plants 20-25 cm. *S. Ballii*
 - GG. Flowers large, 6-7 mm. long; plants 25-50 cm. tall . *S. Kotschyana*
 - AA. Cymes spreading, \pm compact and short *S. cryptophylla*

Verbascum L.

Unless otherwise indicated, the determinations of *Verbascum* and remarks accompanying the species have been made by A. Huber-Morath.

Verbascum amanum Boiss., Fl. Or. 4, 310 (1789).

Prov. Adana, distr. Bahçe (Amanus): Dildil Da., between Başkonuş Y. and Husseyin Oluk Çe., 1,800 m., steep gully, biennial, filaments violet, 27 Aug. 1949, Davis 16382.

Verbascum bellum Huber-Morath in Fedde, Repert. 46, 170 (1939).

Prov. Muğla, distr. Fetbiye (Lycia): Baba Da. above Ak Bel Y., 1,700 m. screes, filaments yellow, biennial (or perennial?) with stems 0.6-1.3 m. tall, 30 July 1947, Davis 13650.

Verbascum Blattaria L. var. **brevipedicellatum** Hal. in Öst. Bot. Zeitschr. 42, 419 (1892).

Prov. Antalya, distr. Elmali (Lycia): Kara Go., in ditches near the lake, 7 Aug. 1947, Davis 13926.

Verbascum campestre Boiss. et Heldr. in Boiss., Diagn. Ser. 1 (12) 5 (1853).

Prov. Ankara (Galatia): Muhan Go. near Ankara, at edge of fresh-water lake, 5 July 1947, Davis 13073; Beynam, fallow fields, 5 July 1947, Davis 13005.

Verbascum cariense Huber-Morath in Fedde, Repert. 46, 180 (1939).

Prov. Muğla, distr. Köyceğiz (Caria): Sandras Da., above Ağla, 1,400 m., *Pinus nigra* subsp. *Pallasiana* forest, 25 July 1947, Davis 13595; Sandras Da. at Gökce Ov., biennial, leaves silvery, 23 July 1947, Davis 13529.

Verbascum cheiranthifolium Boiss., Diagn. Ser. 1 (4) 56 (1844) var. **cheiranthifolium** (var. *typicum* Murb., Monogr. Verbascum 276: 1933).

antherae omnes reniformes, medifixae; connectivum anticarum non apiliosum. Stylus 6-7 mm. longus, basi laxe tomentosus, superne parum incrassatus, stigmatate hemisphaerico terminatus. Capsula globosa, 3-4 mm. diam., dense tomentosa, demum glabrescens, rostro recto 1 mm. longo praedita. Semina minuta, 0.5 mm. longa, 0.4 mm. lata, seriatim foveolata, obovatis cujusque serei longitudinalis 4-5. Floret Jun.

Prov. Antalya (Pisidia): ruins of Termessus, 950 m., 23 June 1948, J. Renz *holotypus in Herb. Huber-Morath*; *ibid.*, in the walls of temples, forming a rounded 1 ft. shrub, 11 Aug. 1947, Davis 13953—*inflorescentia emarcida*; *ibid.*, 1 July 1949, Davis 15447 (*fruct.*).

This saxatile species is related to *V. Pestalozzae* Boiss., but differs in its glabrescent glandular inflorescences, shorter and narrower calyx-teeth, and smaller flowers with the anterior filaments glabrous at the apex.

Verbascum flavipannosum Huber-Morath in Candollea, **12**, 210 (1949).

Prov. Konya, distr. Bozkiir (Isauria): S. Karance D. between Geyik Da. and Bozkiir, biennial, specimens grazed, filaments more or less violet, 2 Sept. 1947, Davis 14628.

Verbascum glomeratum Boiss., Diagn. Ser. 1 (4) 52 (1844).

Prov. Denizli (Caria): Taş Ocağı near Denizli, hillsides, biennial, leaves golden-floccose, filaments yellow, 13 July 1947, Davis 13275, and between Kizilirmak Köy and Kizilhissar, on conglomerate, 13 July 1947, Davis 13284; *distr. Acipayam*, on Boz Da. between Abbas and Geyran Ya., 16 July 1947, Davis 13313, and Monastir Ormani between Abbas and Acipayam, in open *Pinus Brutia* forest, 18 July 1947, Davis 13451. *Prov. Muğla, distr. Fethiye (Lycia)*: foot of Girdev Da. near Girdev Go., 1,800 m., rocky hillsides, biennial, 4 Aug. 1947, Davis 13814. *Prov. Antalya, distr. Kemer (Lycia)*: Teke Da. at Ovacik, 1,100 m., at edge of plain where scrub and forest have been cleared, biennial, fl. large, 12 July 1949, Davis 15190; *distr. Gebiz (Pisidia)*, Bozburun Da. between Pinargözü Y. and Boğaz Azzi, 23 July 1949, Davis 15449. *Prov. Konya, distr. Bozkiir (Isauria)*: Bozkiir vadisi, leaves tawny, 2 Sept. 1949, Davis 16598.

Verbascum glomerulosum Huber-Morath in Candollea, **12**, 194 (1949).

Prov. Antalya, distr. Alanya (Isauria): above Gedevet Y. near Durbanas, N. of Alanya, in *Pinus nigra* subsp. *Pallasiana* forest, 25 Aug. 1949, Davis 14270.

Verbascum inulifolium Huber-Morath, spec. nov. (Sect. *Bothrosperma* Murb., Subsect. *Singuliflora* Murb., A. *Cladotricha* Murb., b. *Ebracteolata* Murb., β. *Flores Isandri.*)

Species suffruticosa, distinctissima, foliis simulantibus ea quae *Inula heterolepis* Boiss. monstrat.

Planta perennis humilis, 20-60 cm. alta, basi suffruticosa et valde ramosa, collo radices pluricaulis, tota tomento molli albo-pannoso dense vestita; inflorescentia insuper modice glandulosa. Rami teretes dense foliosi, alii longati in paniculam abeuntes, multo breviores anno sequente floriferi. Folia omnia parva crenulata crassiuscula dense albo-pannosa; folia inferiora mediaque ramorum fertiliū obtusissima, petiolo 0.5-2 cm. longo praedita,

lamina late ovata vel obovata vel orbiculata, 1.5-4 cm. longa, 1-3 cm. lata in axillis \pm fasciculiferis; folia superiora minora ovata vel late elliptica obtusa vel obtusiuscula vel acutiuscula, sessilia, \pm semiamplexicaulia; foliorum sterilibus \pm petiolata, minora, congesta. Panicula laxiflora 8-20 cm. longa \pm ramosa; rami tenues, 5-10 cm. longi, ascendenter erecti. Flore in bractearum axillis solitarii. Bracteae acutae, inferiores lineari-lanceolatae superiores lineares, 2-10 mm. longae, dense stellato-tomentosae nec modice glandulosae. Pedicelli ebracteolati, circ. 1 mm. longi, erecti. Calyx 4-8 mm. longus, sicut pedicelli bracteolaeque pilis stellatis tomentosis necnon glandulis stipitatis sparsis obsitus, usque ad basin in lacinas lanceolatae lineares acutas divisus. Corolla lutea, rotata, circ. 1.5 cm. diam., non pellucida-punctulata, extra stellato-tomentosa, intus ad basin loborum superiorum parce ciliata, tubus 0.5 mm. longus, lobi orbiculares. Filamenta antica apice glabra, ceterum ut postica papillis violaceis apice \pm clavatis dense villosa. Antherae omnes reniformes mediofixae, connectivum anticarum non papillosum. Stylus 6 mm. longus, inferne laxe tomentosus, superne incrassatus stigmate obovato terminatus. Capsula stellato-pilosa, ovata vel elliptica brevissime rostrata, 4-5 mm. longa, 2-3 mm. lata; pericarpium crassum. Semina obconico-prismatica, circ. 1 mm. longa, 0.7 mm. lata, seriatis foveolata, foveolis cujusque seriei longitudinalis 4-6. Floret Jun.

Prov. Mersin, distr. Silifke (Cilicia Trachea): above Silifke on the road to Gülnar, rocky slopes in *Pinetum Brutiae*, 400 m., a very woody perennial 20 Aug. 1949, Davis 16353 (*fruct.*); above Silifke on the road to Gülnar *Pinetum Brutiae*, 23-24 km. from Silifke, 780-840 m., 9 June 1950, Huber-Morath 9512 (*holotypus* in *Herb. Huber-Morath*; *isotypus* in *Herb. Boiss.*).

The new species is a very peculiar one, allied to the biennial *V. isauricum* Boiss. et Heldr. It has leaves like those of *Inula heterolepis* Boiss., and must be ranged in the system between *V. isauricum* Boiss. et Heldr. and the frutescent species like *Verbascum Pestalozziae* Boiss. and *V. dumulosum* Huber-Morath et Davis.

Verbascum isauricum Boiss. et Heldr. in Boiss., *Diagn. Ser.* 1 (12) 22 (1853).

Prov. Konya, distr. Ermenek (Cilicia Trachea): Ermenek, filaments violet 14 Aug. 1949, Davis 16192 (*locus classicus*).

Verbascum kastamunicum Murb., *Monogr. Verbascum*, 265 (1933).

Prov. Ankara (Galatia): Beynam, steppe, biennial, filaments yellow, 5 July 1947, Davis 13040.

Verbascum* \times *kemerense Huber-Morath, *hybr. nov.* (*V. cheiranthifolium* Boiss. \times *V. orgyale* Boiss. et Heldr.).

Planta inter species dictas intermedia. Differt a *V. cheiranthifolio* Boiss. planta superne glabrescens, calyx brevior, 1.5 mm. longus, lacinae calycis angustiores, sublineares. A *V. orgyale* Boiss. et Heldr. differt: caulis humilior 70 cm. altus, gracilior, bracteae triangulari-lanceolatae nec subulato-lineares —Grana pollinis tabescentia.

Prov. Antalya, distr. Kemer (Lycia): Kesme Boğ. near Kemer, 8 July 1949 Davis 15151 (*holotypus* in *Herb. Kew.*).

Verbascum lasianthum Boiss. apud Benth. in DC., *Prodr.* 10, 234 (1846).

Verbascum pycnostachyum Boiss. et Heldr. in Boiss., Diagn. Ser. 1 (12) 11 (1853).

var. **pycnostachyum**.

Prov. Denizli, distr. Acipayam (Caria): Acipayam, on chalky waste ground, biennial, 18 July 1947, Davis 13450. *Prov. Konya, distr. Bozkeir (Isauria)*: Bozkeir, 1,100 m., biennial, 7 Sept. 1949, Davis 16599.

var. **uschakense** Murb. in Lunds Univ. Årsskrift, n.f., 32 (1) (Nachtr. Verbascum) 32 (1936).

Prov. Antalya, distr. Gebiz (Pisidia): Bozburun Da., between Boğaz Azzi and Tozlu Çukur Y., 1,500 m., biennial, 24 July 1949, Davis 15571.

Verbascum Renzii Huber-Morath in Fedde, Repert. 46, 175 (1939).

Prov. Muğla (Caria): near Doğuşbelen, dry slopes, 20 July 1947, Davis 13481; *distr. Köyceğiz (Caria)*, Sandras Da. bear Kökluce, 1,500 m., 22 July 1947, Davis 13531.

Verbascum sinuatum L., Sp. Pl. 178 (1753) var. **sinuatum**.

Prov. Denizli (Caria): Denizli, waste ground, 12 July 1947, Davis 13227.

Verbascum splendidum Boiss., Diagn. Ser. 1 (4) 53 (1844).

Prov. Muğla (Caria): Muğla, waste ground, 20 July 1947, Davis 13490. *Prov. Antalya, distr. Elmali (Lycia)*: Yuva, by village in dry water course in *Quercus coccifera* maquis, often several basal rosettes (biennial?), 7 Aug. 1947, Davis 14222.

Verbascum symes Murb. et Rech. fil. in Lunds Univ., Årsskrift, n.f., 32 (1) (Nachtr. Verbascum) 37 (1936).

Prov. Muğla (Caria): near Muğla, limestone slopes, very irritating indumentum, 20 July 1947, Davis 13485.

Verbascum tauri Boiss. et Kotschy in Boiss., Diagn. Ser. 2 (3) 145 (1856).

Prov. Niğde, distr. Ulukışla (Cilicia): N. side of Bulgar Da. between Sari Tepe Y. and Alihoca, biennial, filaments violet, 3 Sept. 1949, Davis 16527.

Verbascum mucronatum Lam. × **V. sinuatum** L. var. **sinuatum**.

Prov. Denizli (Caria): Denizli, on waste ground between the parents, 12 July 1947, Davis 13228—*grana pollinis tabescentia*. This hybrid has already been found by Delile (Thellung, La flore adventice de Montpellier, 469; cf. Murbeck, Monogr. Verbascum, 200).

Verbascum cheiranthifolium Boiss. × **V. orgyale** Boiss. et Heldr.?

Prov. Antalya, distr. Alanya (Isauria): Han Boğaz forest near Geyik Da., 1,500 m., scattered in *Abietum*, biennial, stem about 1.5 m. tall, paniced, 30 Aug. 1947, Davis 14715—*grana pollinis 90 per cent. tabescentia*. (No other *Verbascum* was seen in this locality.—Davis.)

Verbascum hybr.—**V. cheiranthifolium** Boiss. × **V. sp.**

Prov. Muğla, distr. Köyceğiz (Caria): between Dalaman and Göcek, 300 m., in *Pinetum Brutiae*, by roadside, 26 July 1947, Davis 13565; *distr. Fethiye*

Wulfenia orientalis Boiss., *Diagn. Ser. 1* (4) 75 (1844).

Prov. Adana, distr. Bahçe (Amanus): Dildil Da. above Haruniye, 800 m., 16 Aug. 1949, Davis 16454; and cult. in Hort. Edin.

This beautiful species, only known from the Amanus region, is most nearly related to the Albanian *W. Baldacii* Degen.

ADDENDUM

Siphonostegia syriaca (Boiss. et Reut.) Boiss., *Fl. Or.* 4, 471 (1879).

Prov. Antalya, distr. Kemer (Lycia): Tahtali Da., 1,600 m., rare on limestone cliff, plant suffrutescent green viscid, fl. with gloomy purple hood, lip yellowish shaded with purple, 17 Aug. 1947, Davis 14183.

This remarkable perennial is confined to isolated localities in Southern Anatolia and Greece. It is evidently a relict, the other two species of the genus being annuals found in China. In facies *S. syriaca* resembles the related North American genus *Schwalbea* L. more closely than the other species of *Siphonostegia* which, however, it resembles in the diagnostic structure of its calyx. It was originally made the type of a new genus: *Lesquereuxia* Boiss. et Reuter (*Boiss., Diagn. Pl. Or. Ser. 1* (12) 43: 1853)-

PROV. KASTAMONU : Küre—Kastamonu, *Davis* 21710 (forma caulibus nudis).

Specimens of subsp. *macrostylum* have been seen from Greece, Albania, Thasos and Anatolia. In Turkey it often replaces the more widespread subsp. *tuberosum* between 1200 and 2000 m. In subalpine regions it has been found in the shade of *Quercus cerris*, *Cedrus libani* subsp. *stenocoma* and *Juniperus excelsa*. *Davis* 21710 is the only gathering I have seen with naked stems—a character of subsp. *tuberosum*; the gathering is a uniform one, and was made in a fallow field at 1200 m.

G. tuberosum s.l. requires further revision in the Nearer East. There appears to be a distinctive race in the Lebanon. It might be mentioned here that Sibthorp & Smith's description and plate of *G. tuberosum* (Fl. Gr. vii, t. 659) combine the characters of subsp. *tuberosum* and subsp. *macrostylum*. [P. H. Davis].

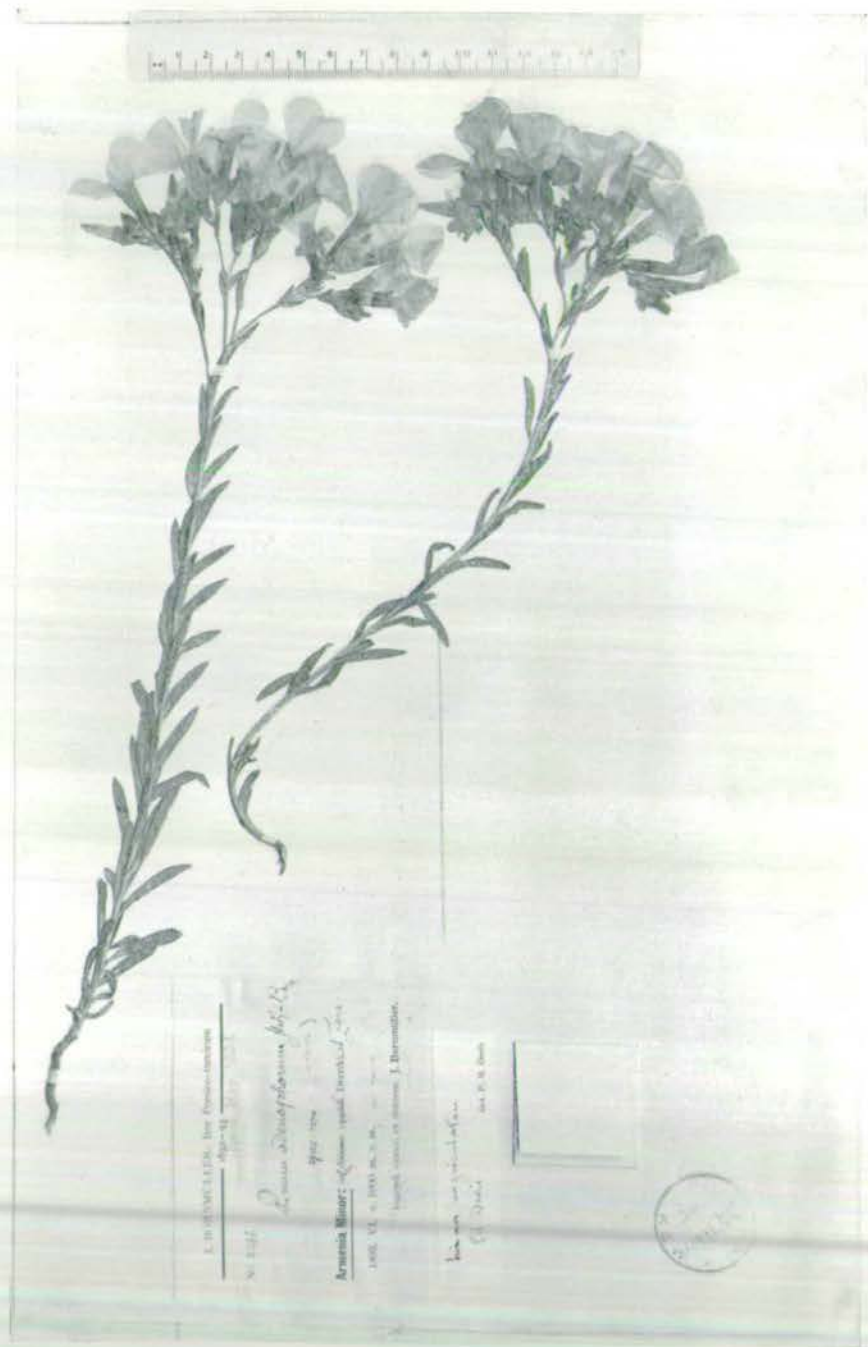
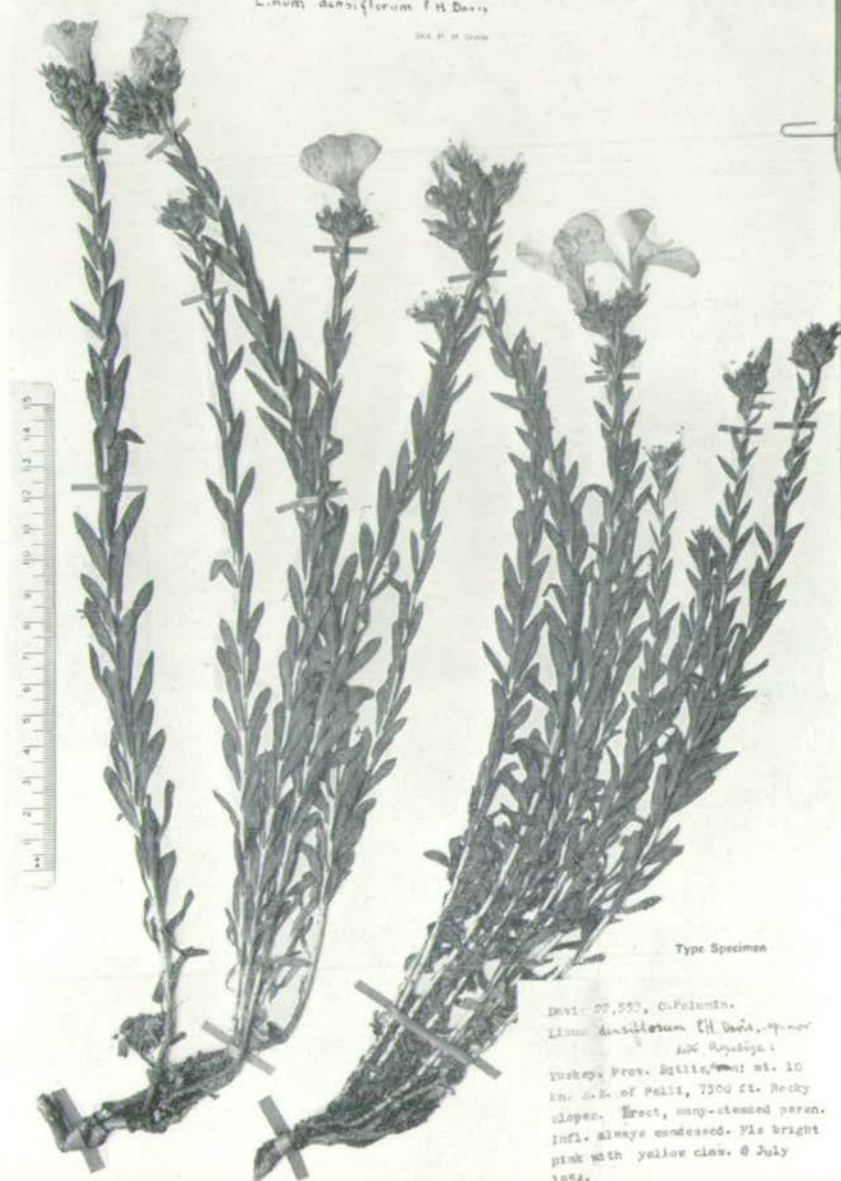


PLATE 6A *Linum unguiculatum* P. H. Davis. (Bornmüller 3296.)

Linum densiflorum P. H. Davis

DR. P. H. DAVIS



Type Specimen

Davis 22,553, C. F. F. F. F.
Linum densiflorum P. H. Davis, sp. nov.
TURKEY: Prov. Sivas, 10000 ft. 10
mi. S.E. of Palli, 7500 ft. Rocky
slopes. Erect, many-stemmed perenn.
Infl. always condensed. Fls. bright
pink with yellow claw. 8 July
1954.

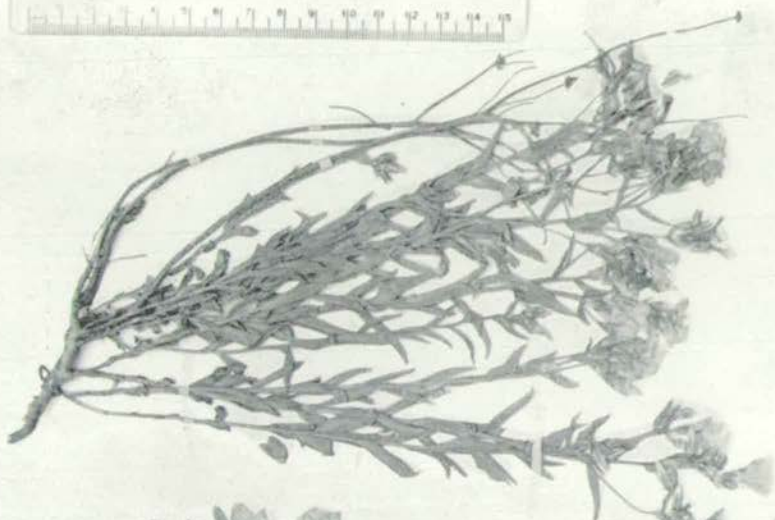
PLATE 6B *Linum densiflorum* P. H. Davis. (D. 22553.)

Linum
seljukorum P.H. Davis

Det. P. H. Davis



PLATE 7 *Linum seljukorum* P. H. Davis. (D. 14777.)



Type Specimen.

Linum scabrinerve P. H. Davis

Determinator: T. G. C.

Fam. *Linac.*
Spec. *Linum flavum* L.
ibericum Boiss.
Loc. G. G. Hill at G. A. Hill
Orange, Virginia

10-6-32

leg. W. Kotté

PLATE 8A *Linum scabrinerve* P. H. Davis. (Kotte 283.)



Linum triflorum

Det. P. H. Davis

Type Specimen

Leaves 23, 507, 674-675
 Line Halloran of Davis, 1874

Thorny tree, 1874; 1875 of
 Mount Mansfield, New York, 1875,
 1876. St. with 1875-1876
 (1875). The type specimen
 Davis - 1874 1875.

PLATE 8B *Linum triflorum* P. H. Davis. (D. 23563.)

L. thracicum Degen in Öst. Bot. Zeitschr. xliii, 55 (1893).

Prov. Bursa: Soukpınar (Ulu Dağ), 4 July 1944, M. Heilbronn (K).

The species is apparently new for Turkey. The inflorescence is more elongated and the leaves narrower than in the typical form from N. Greece.

Material is required of any perennial yellow-flowered species of *Linum* from the region of Bursa and Istanbul, since their identity and status remain uncertain. Both *L. elegans* Spruner var. *elatius* Hal. and *L. tauricum* Willd. have been recorded by Aznavour from the Bosphorus.

AN UNDESCRIBED SPECIES OF LINUM?

Attention is drawn to a "curious *Linum* with opposite leaves and purple flowers" referred to by Spratt & Forbes (Travels in Lycia, Milyas and the Cibyratas, ii, 145: 1847). This was found in May by E. Forbes—quite a competent taxonomist—near Oenoanda, a classical Lycian site at Incealiler between Fethiye and Elmali. As the only Oriental *Linum* known to have opposite leaves is the white-flowered *L. catharticum*, the identity of Forbes' plants invites investigation. I have not been able to trace Forbes' specimen (many of which are preserved at Kew), and the plant should certainly be looked for again. Can it possibly be *Moenchia caerulea* Boiss. in the Caryophyllaceae?

Annuals and Biennials (review)*—There are several books on this subject on the market and in libraries, but I doubt if any are quite so comprehensive and knowledgeable as Mr. Booth's Encyclopædia. Furthermore most of the knowledge imparted here has been gained by practical experience, for, of the 1400 species and varieties of annual and biennial plants mentioned in this work he has grown over 1200 himself. It covers every aspect of their cultivation in Britain.

At present-day prices, these plants are probably less expensive than any others and their popularity is increasing. Yet the number of species available in this country is pitifully small compared with their abundance in nature. It seems that, apart from one enterprising firm of seedsmen, there has been no attempt to remedy this and encourage the popular trend. With this object the author includes a list of sources abroad from which seeds of rarer species are procurable.

The volume is divided into two parts. The first, about 150 pages, consists of a general account of the cultivation of these plants. Not only does this cover how and where to grow them, but includes excellent lists of insects and other pests with which the gardener may be troubled, together with the latest chemicals to control their ravages. Pathogenic organisms and fungicides are dealt with in the same lucid fashion and the section ends with a discussion on nutritional disorders.

In the second part, under each genus the species in cultivation are described. Detailed horticultural requirements and particular diseases are also given for each genus. There are, however, a few conspicuous omissions from these lists, among them *Primula Viali*, *P. nutans*, *Campanula Sartori* and *Saussurea stella*. With the exception of the last named, they are not truly biennials but species which should be treated as such, and Mr. Booth rightly includes these in his definition of biennials. The text is illustrated with 88 good photographs all taken by the author, 8 of them in colour. Among the glossaries at the end, the list of chromosome numbers (from Darlington's "Chromosome Atlas of Cultivated Plants"), included here as a guide to breeders, is worthy of notice.

The nomenclature has been based on Bailey's "Hortus Second" as being an authoritative work which covers most of the plants. Criticism of this aspect is therefore invalid. As regards citation of authorities after Latin names, the absence of which is a defect so far as the botanist is concerned, Mr. Booth has laid himself open to a charge of inconsistency. The authorities of all insect and fungal names are given; yet they are completely omitted from those of flowering plants.

It only remains to add that this encyclopædia is liberally tabulated, well indexed and beautifully produced. Typographical errors are very few. The criticisms are trivial measured against the author's achievement and will not, I hope, damage the popularity his work deserves.

A. J. C. GRIERSON

* An Encyclopædia of Annual and Biennial Garden Plants, by C. O. Booth. London, Faber & Faber, 1957. Pp. 488, 44 plates (4 col.). Price 84 shillings.

MATERIALS FOR A FLORA OF TURKEY: III

RANUNCULACEAE: I

P. K. CHOWDHURI, P. H. DAVIS & M. HOSSAIN
(University of Edinburgh)

DELPHINIUM L.

Sp. Pl. i, 530 (1753), Gen. Pl. ed. 5, 236 (1754)

Huth's monograph of *Delphinium* (Bot. Jahrb. xx, 322-499: 1895) provides a useful basis for the study of this beautiful genus, but it has some serious shortcomings. A slackness about the citation of types and a carefree attitude to nomenclature detract considerably from the value of the work.

Though less difficult than *Aconitum*, *Delphinium* is by no means an easy genus. As with most genera highly specialized for insect pollination, geographical distribution is an invaluable aid to the elucidation of taxonomic problems in *Delphinium*. Nevertheless, the pattern of variation suggests that allopatric introgression sometimes occurs, particularly between certain members of the "*D. hybridum* Steph. ex Willd." group in the Levant.

In this account, Chowdhuri and Davis are responsible for the treatment of Subgen. *Delphinium*, and Hossain and Davis for Subgen. *Consolida*. Unless otherwise indicated, all specimens cited have been examined. We are much indebted to the Directors of the Kew, British Museum, Geneva, Vienna University and Uppsala herbaria for the loan of type material.

SUBGENUS DELPHINIUM

Syn.: Subgen. *Eudelphinium* (Huth) Dalla Torre & Harms, Genera Siphon. 165 (1901).

Except in the *D. peregrinum* L. group, the shape of the petals is seldom an important character for the separation of closely related species of Subgenus *Delphinium* in the Levant. The form of the bracts (and bracteoles) provides valuable specific criteria, but many species that usually have simple lower bracts may produce trifid or even leafy ones when growing in lush habitats. Failure to allow for this variation in the lower bracts has led to the wide separation of some closely related (or even synonymous) species in Huth's monograph, and the same applies to glabrous *versus* hairy carpels—many species are very variable in this respect, even within the same population (e.g. *D. albiflorum* DC.). Stressing the indumentum of the carpel, Huth has placed very closely related taxa of the "*hybridum*" group in different "tribes". On the other hand, the position of the bracteoles on the pedicels is (within limits) surprisingly constant in different species. The same applies to the shape of the sepal spur—as was well-realized by Huth—but perhaps still more to the form of the petal spur which

D. albiflorum var. *Candolleianum* Huth in Bot. Jahrb. xx, 439 (1895).

D. albiflorum var. *eginense* Huth in l.c. 439 (1895).

TURKEY. In Armenia, *Tournefort* (holo. Paris, n.v.). Armenia, *Calvert & Zohrab*. Amasia, *Manisadjian* 675 (as *D. leiocarpum* Huth). Amasia: in rocky alpine places on Sana Dağ, 15 Jul. 1889, *Bornmüller* 972 (as *D. ponticum* Hausskn. & Bornm., ms.). Prov. Kastamonu: Tossia, in sub-alpine meadows, 29 Jul. 1892, *Sintenis* 4883 (as *D. hybridum* Steph. ex DC. var. *hirsutum* Freyn & Sint., m.s.).

GREECE (Athos Peninsula). Vlachani, 300 m., *Rev. & Mrs. Thompson* 934. Ravine above Strati, 31 July—9 Aug. 1947, *C. N. Goulimy* 7.

The taxonomic position of *D. albiflorum* DC. has been much confused by taxonomists. Nevski (in Komarov, Fl. U.R.S.S. vii, 181; 1937) treated it as a synonym of *D. ochroleucum* Stev. ex DC., as did Boissier when he reduced the latter (in our view unjustifiably) to a synonym of *D. hybridum* Steph. ex DC. (= *D. Schmalhauseni* Alb.). We have not seen the type of *D. albiflorum*, but Delessert's figure (evidently based on Tournefort's specimen) shows that it is quite distinct from *D. ochroleucum*—a yellowish flowered Caucasian species with a denser inflorescence, narrow bracts and steeply ascending spurs.

Huth recognized the specific distinctness of *D. albiflorum*. It is, in fact, very closely related to *D. fissum* Waldst. & Kit. (placed—as *D. hybridum* Steph. ex Willd.—in a different "tribe" by Huth), and might even be treated as a subspecies of the latter. The ovate-lanceolate, usually membranous-margined bracts and bracteoles are broader and more membranous in Calvert & Zohrab's Armenian gathering (a close match with Delessert's figure) than in specimens from further west. Nevertheless, *D. albiflorum* has a distinctive facies throughout its range, and possesses several other characters that separate it from *D. fissum*, as can be seen from the key below. We are therefore maintaining it as a separate species. The taxon is extremely variable in the indumentum of its inflorescence axis, sepals, spur and carpels, varying from densely pubescent to glabrous, even in the same gathering.

D. albiflorum has a disjunct distribution in Northern Anatolia. Two gatherings from the Athos peninsula in Greek Macedonia must also be referred to this species; although the bracts are scarcely membranous-margined, the plants are otherwise typical of this species. These Greek specimens apparently constitute the first records of *D. albiflorum* from Europe. The species is intermediate morphologically and geographically between *D. fissum* subsp. *fissum* and *D. ochroleucum*.

Key to *D. fissum* and *D. albiflorum*

- 1a. Bracts and bracteoles ovate-lanceolate, usually membranous-margined, stem 50–60 cm. tall, 2–3 mm. thick, simple; lower leaves 4–7 cm. across; median pedicels shorter than the sepals; flowers (incl. spur) 19–22 mm. long. Leaves adpressed pubescent, with oblong-linear or linear laciniae 1–3 mm. broad; inflorescence, sepals and follicles pubescent or glabrous. Flowers pale blue or whitish. (N. Anatolia; Athos peninsula) *D. albiflorum*

TURKEY (Kurdistan). Prov. Van, dist. Hoşap: Kepir Dağ, 2600 m., 30 July 1954, *Davis & O. Polunin* (D. 23325); *ibid.*, 2800 m., 30 July 1954, D. 23349; dist. Şatak: Kavuşşahap Dağ, 2700 m., 24 July 1954, *Davis & O. Polunin* (D. 23061); dist. Gevaş: Artos Dağ, 2850 m., 16 July 1954, *Davis & O. Polunin* (D. 22801); *ibid.*, 2550 m., D. 22734. Prov. Bitlis/Van: mt. 10 km. S.E. of Pelli, 2400 m., 8 July 1954, *Daviş & O. Polunin* (D. 22593). Prov. Hakkâri: Cilo Dağ, above Diz deresi, 2400 m., 7 Aug. 1954, *Davis & O. Polunin* (D. 23954—holo. E; iso. K); Kara Dağ, 2700 m., 15 Aug. 1954, *Davis* 24370.

Habitat: Rocky mountain sides, 2550–2850 m., often on slopes above streams, usually on limestone.

This attractive species is evidently most closely related to *D. micranthum* Boiss. & Hohen. from Iraqi Kurdistan, from which it is readily distinguished by its less paniculate inflorescence with a spreading viscid indumentum, denser racemes, longer bracts and bracteoles, and erect pedicels. It often has larger flowers. Type material of *D. micranthum* has not been seen, but several recently collected sheets from Iraq show it to be rather variable in flower size (sepals 7–10 mm. long, spur 10–15 mm.) and in the form of its lower bracts; these are described as simple by Boissier and Huth, but in fact they are frequently trifid as they normally are in *D. carduchorum*.

It seems likely that Nâbelék's Turkish record of *D. micranthum* from Hakkari should be referred to *D. carduchorum*, which is the most widespread perennial *Delphinium* in the mountains of Turkish Kurdistan.

It is possible that *D. carduchorum* in the western part of its range has been "contaminated" by genes from *D. dolichostachyum* Chowdhuri & Davis. Two gatherings of *D. carduchorum*—*Davis* 22593 (Pelli) and *Davis* 23061 (Kavuşşahap Dağ)—have crisply adpressed indumentum in the region of the inflorescence, and part of *D.* 22593 also has exceptionally long and narrow bracts and bracteoles—variations that are in the direction of *D. dolichostachyum*.

In habit *D. carduchorum* resembles *D. cyphoplectrum* Boiss. from N. Iraq and Persia, but differs in the following important diagnostics: angled stems, nature of the indumentum, usually tripartite lower bracts, position of the bracteoles, slender pointed spur and shape of the pubescent follicles.

***Delphinium dolichostachyum* Chowdhuri & Davis, spec. nov.**

Affinis *D. carduchorum* Chowdhuri & Davis sed racemo terminali multifloro denso spiciformi, bracteis et bracteolis etiam angustioribus valde prominentibus, indumento inflorescentiae crispe et adpresse puberulo floribus minoribus pallide caeruleis recedit. A *D. dasystachyo* Boiss. & Bal. caule elato ramoso, indumento crispe adpresso, forma foliorum glabrescentium, bracteis inferioribus haud multipartitis minus vaginantibus, bracteis superioribus angustissimis valde differt.

Herba perennis, 56–85 cm. alta, radicibus fasciculatis. *Caulis* erectus, acute angulatus, subsulcatus, ad medium plerumque conspicue ramosus, superne crispe ad appresse puberulus, inferne vix glabrescens; rami racemiferi 3–5, tenues, ascendenti-erecti, axe centrali breviores. *Folia* caulina inferiora et mediana palmatim 3–5-secta, 5–8 cm. lata, glabrescentia, longe petiolata; segmenta profunde 3–5-partita, laciniis lineari-lanceolatis vel lanceolatis 2–5 mm. latis acutis vel acuminatis; petiolus

striatus, basi sensim subvaginatus; folia caulina superiora pauca, minora, trisecta, parce et adpresse puberula vel glabrescentia segmentis angustioribus, petiolo 0.5–4 cm. longo basi parce ciliato subvaginato sed vix amplexicauli; folia basalia et caulina inferiora subanthesi emarcida. *Racemus* terminalis 13–23 cm. longus, densus, multiflorus (ad 45-florus), spiciformis, lateralibus longior. *Bracteae* (praesertim eae racemi terminalis) prominentes; infimae 1 vel 3 foliosae, plurisectae, pedicellis multo longiores, basi anguste vaginatae; inferiores et medianae tripartitae segmentis lineari-subulatis flores aequantibus vel paulo superantibus; superiores simplices lineari-subulatae ut pedicelli et bracteolae crispae puberuli flores subaequantes. *Pedicelli* 9–25 mm. longi, ascendenti-erecti. *Bracteolae* lineari-subulatae in parte superiore pedicelli affixae sepaşa subaequantes vel etiam superantes. *Flores* pallide caeruleae, parvae. *Sepala* 6–9 × 3–4 mm., oblongo-obovata vel elliptico-ovata, ad apicem obtusa vel rotundata, intus glabrescentia, extra dense adpresse puberula; calcar 9–12 mm. longum, tenue, attenuatum, acutum, plerumque deorsum curvatum, interdum strictum. *Petala* inclusa; superiora bina, glabra, limbo parvo breviter bifido basi in calcar tenue acutum attenuata; petala inferiora bina 8–9 mm. longa, limbo late ovato (4.5 × 4.5 mm.) supra medium bifido facie barbato in stipitem puberulam vix longiorem angustato. *Carpella* tria, pubescentia; styli caerulescentes. *Folliculi* ovato-oblongi (5–)7–9 × 3–4 mm., subpatentim hirsuto-pubescentes. *Semina* triquetra, 1.5 mm. longa, squamata.—Floret Aug.

TURKEY. Prov. Bitlis, dist Kotum (Turkish Kurdistan): Karz Dağ above Kemer, 2200 m., in limestone ravine, 24 Aug. 1954, *Davis & O. Polunin* (D. 24566—holo. E; iso. K).

D. dolichostachyum is certainly very closely related to *D. carduchorum* Chowdhuri & Davis described above, a species that is common in the mountains to the East of it. The present species differs from the latter in the long, dense, spike-like inflorescence of the main stem, more prominent and even narrower bracts and bracteoles, smaller, pale blue flowers, and crisply adpressed puberulous indumentum of the inflorescence (see note under *D. carduchorum*).

In its dull inflorescence of small pale flowers, it shows some resemblance to *D. dasystachyum* Boiss. but differs markedly in the following characters: tall, branching stem, crisply adpressed indumentum of the inflorescence, almost glabrous leaves with fewer segments and a longer petiole with a less conspicuously vaginate base, tripartite (instead of multipartite) lower bracts with a much less vaginate base, and linear-subulate (instead of broadly ovate, membranous and acuminate) upper bracts.

On the Edinburgh sheet (holotype) the inflorescence is perfect but the median and lower stem leaves have withered away; these are present in the Kew specimen in which the top of the stem has been eaten off. More material is required of this rather critical species.

Delphinium vanense Rech. fil. in *Symb. Bot. Upsal.* xi (5), 8 (1952).

TURKEY. Prov. Van: Olsus am Vans-see, 20 km. O.S.O. von Tatvan, 1900 m., *Frödin* 328 (holo. Upsala!); dist. Gevaş; Artos Dağ, 2850 m., 16 July 1954, *Davis & Polunin* (D. 22753). Prov. Bitlis/Van: mt. 10 km. S.E. of Pelli, 2550 m., *Davis & O. Polunin* (D. 22542).

a syntype of the earlier *D. anthoroideum* Boiss. where it is cited as "65 bis"; it is referred by us to *D. sclerocladum* Boiss. var. *pseudoanthoroideum*.

We have examined the syntypes collected by Bourgeau (Baybury) and Calvert (Erzurum), both of which agree with the type description, but we have been unable to find Hohenacker's specimen from Talysch. Nevertheless, there is a specimen of *D. Hohenackeri* (as *D. Aconiti*) in the Boissier Herbarium labelled as "Talusch, Meyer a. 1842", and at Kew a sheet collected by Hohenacker in 1838 from "Kaelaechan in ditione Swant Georg. Cauc."; one of these may possibly be syntype material. In view of this ambiguity, it seems best to choose Bourgeau's representative gathering as the lectotype of *D. Hohenackeri*.

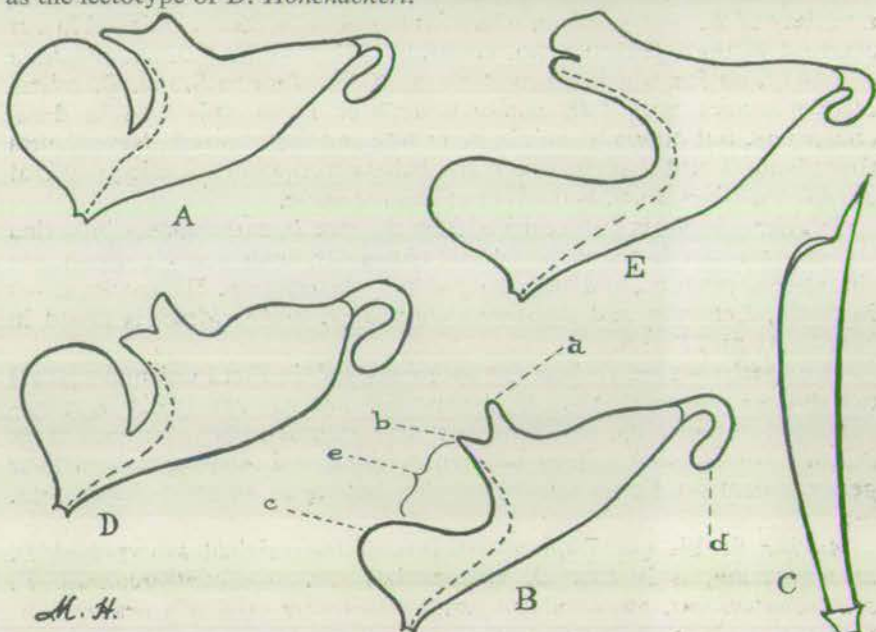


FIG. 1. A, B, D & E—side view of the "petal". A, *D. anthoroideum* Boiss. (Davis 23802); B, *D. stenocarpum* Hossain & Davis (Davis 16638); C, follicle of same; D, *D. sclerocladum* Boiss. var. *pseudoanthoroideum* Hossain & Davis (Davis 10030); E, *D. Hohenackeri* Boiss. (Balls 1441A). a, upper lobe; b, one of two intermediate lobes; c, one of two lower lobes; d, circinately involute spur-apex; e, sinus between the intermediate and lower lobes. All $\times 4$.

Typical *D. Hohenackeri* is apparently confined to Turkish Armenia, Transcaucasia and Persia. However, there are at Kew two specimens from Lebanon (and possibly Syria), both labelled as *D. anthoroideum* Boiss., that seem to belong to *D. Hohenackeri*. These are: Syria, Pinard a. 1846; Syria, prope Eden, Boissier a. 1846. They are not typical of *D. Hohenackeri*, but in floral morphology come closer to it than to any other species. The spur is as short and involute as in *D. Hohenackeri*; the intermediate "petal" lobes are rather obtuse, and, together with the upper lobe, form a short, tube-like body. But the upper and intermediate lobes are not as approximate as in this species, and the habits of the two specimens are atypical. Nevertheless, these specimens cannot be assigned to a variety of *D. sclerocladum* which is the common species of this affinity in Lebanon and Syria.

above. The distribution of the four subspecies, and of the closely allied *D. armeniacum* Stapf ex Huth, is shown on the map (fig. 3); atypical or intermediate specimens have been omitted.

Delphinium armeniacum Stapf ex Huth in Engler, Bot. Jahrb. xx, 380 t. vii, f.9 (1895). [Fig. 2,B.]

TURKEY. Armenia turcica: Sipikordagh versus Bendola, a.1890, *Sintenis* 3177 (holo. W; iso. K!). Prov. Gümüşane: Tekki to Baibout, 1100 m., stiffly branching, stems 3-18 in., fls. deep blue with purple centre, spur $\frac{1}{2}$ in. long, curved downwards, steep hot, non-lime screes, 19 July 1934, *E. K. Balls* 1756; Kiesaedagh, 18 Jul. 1889, *Sintenis* 1320.



FIG. 3. Map to show the distribution of *D. armeniacum* Stapf and the subspecies of *D. hellesponticum* Boiss. in Turkey.

- *D. hellesponticum* subsp. *hellesponticum*
- ▼ " " *aintabense*
- ▲ " " *campylopodum*
- ⊕ " " *macedonicum*
- ◆ *D. armeniacum*

Turrill (in Hook. Ic. Pl. Ser. V, ii, tab. 3152: 1932) treated *D. armeniacum* as a synonym of *D. macedonicum* Halácsy & Charrel (see discussion under *D. hellesponticum* above). However, we prefer to follow Huth in regarding it as a separate species. It is certainly very close to *D. hellesponticum* subsp. *macedonicum* but can be distinguished by its dome-shaped "petal" with a narrow upper lobe, even longer spur, deep blue flowers and the pattern of stem branching. There is, however, a specimen from Lycaonia (Vil. Konia, distr. Ereğli, Braachen bei Perinde, 1600 m., Jul. 1912, *Siehe* 432—BM) which is somewhat intermediate between the two taxa though nearer to *D. armeniacum*. More material from this region is required, and signs of introgression should be looked for in the field.

A key to the Turkish species in the critical "tomentosum" group is given below; *D. tomentosum* is included, although it does not occur in Turkey.

- 1a. "Petal" \pm entire and semicircular *D. olopetalum* Boiss.

TURKEY. Prov. Adana (Cilicia): Bozanti, 750 m., a. 1896, *Siehe* 362 (as *D. axilliflorum* DC.; holo. E). Prov. Mersin: bei Mersin, *Siehe* 403 (Ankara).

D. cruciatum is very closely related to *D. axilliflorum* DC., [Fig. 4, A, B.] common in S.E. Anatolia, and differs from it only in floral characters. The new species is distinguished by its cruciate "petal" with nervulose, oblong-orbicular lateral lobes—instead of the kite-shaped petal of *D. axilliflorum*. In addition, *D. cruciatum* differs from the latter in the shape of its posterolateral sepals which are more or less clawed with a rhomboid blade.

The new species is known only from Cilicia, at the western extremity of the range of *D. axilliflorum*.

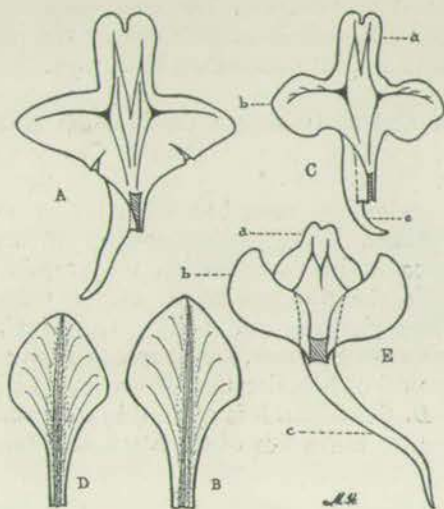


FIG. 4. A, C, & E—"petal" spread open. A, *D. axilliflorum* DC. (Balls 2243); B, postero-lateral sepal of same; C, *D. cruciatum* Hossain & Davis (*Siehe* 403); D, postero-lateral sepal of same; E, *D. cornutum* Hossain & Davis (*Calvert & Zohrab*). a, upper lobe; b, lateral lobe; c, spur. All $\times 2$.

Delphinium Consolida L., Sp. Pl. 530 (1753).

Key to the subspecies

- 1a. Flowers (excl. spur) 12–15 mm. long, rather close to each other on the inflorescence, usually light violet-blue; stem usually once or twice branched; follicle usually thrice as long as broad, glabrous
subsp. *Consolida*
- 1b. Flowers (excl. spur) 9–11 mm. long, rather widely scattered on the inflorescence, deep blue; stem repeatedly branched; follicle usually twice as long as broad:
- 2a. Follicle glabrous subsp. *paniculatum*
- 2b. Follicle adpressed pubescent subsp. *divaricatum*

Debatable Operations; Living Together; Inside the Soil. The book will undoubtedly have a great appeal to gardeners, amateur and professional, and its value in this respect has very obviously been enhanced by the author's own long experience as an amateur gardener. He is thus familiar with the aspects of gardening which require to be discussed and he views scientific and practical matters in perspective. For instance, in assessing the practical value of colour reaction germination tests, he goes on to say:

"But they are not the sort of thing to try in the potting shed, and in point of fact they take just about as many hours of actual work to carry out as a full scale germination test, though you may have to wait much longer for the results of the latter. The colour tests have proved most valuable when a quick answer was wanted from slow germinators."

The book is lightened by many humorous asides and illustrated with delightful line drawings and reproductions from other sources.

E. E. KEMP.

Fruit Growing (review)*.—This is a highly priced, handsomely produced book, but works on commercial fruit production are likely to be valued for the information they contain and not for their appearance. Information of a most authoritative kind there is here in plenty, and no doubt the institution library and those who can afford the high price will find convenience in having all this matter contained within the compass of a single volume. Those who find the price too high, however, will naturally be tempted to ask whether the information could be obtained more cheaply elsewhere. A good deal of it is undoubtedly so available, most of it in fact the work of some contributors to the book under review. On the other hand, a substantial body of the information is not available elsewhere and this comprises the most interesting material.

The weakest section in the book is the part which deals with climate and site. Reference is made to single rows of trees as "shelter belts". Workers in this field nowadays refer to these single rows as "windbreaks" and use the term "shelter belt" when several rows are planted. Spruce is recommended as a windbreak. Presumably it is "Norway Spruce" to which the writer refers and it is regrettable that this species should continue to be recommended for this purpose. No mention is made of the very important matter of protected area in relation to height of windbreak and in addition some very ordinary information is proffered that:

"West winds are cool winds; north-westerly winds bring frost and dry weather in winter. . . . Gales are frequent in the west-coast districts, and are much less frequent in the east. . . . A wind above 75 miles an hour is defined as a hurricane on the Beaufort Scale of Wind Force."

However, this matter occupies but little space in an otherwise valuable work.

E. E. KEMP.

* *Modern Commercial Fruit Growing*; edited by T. Wallace and R. G. W. Bush. London, Country Life Limited, 1956. Price 105 shillings.

1

Extract from
NOTES FROM THE ROYAL
BOTANIC GARDEN

Vol. XXIII No. 2

MATERIALS FOR A FLORA OF TURKEY: IV

RANUNCULACEAE: II

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RANUNCULUS L.

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INTRODUCTION

A monograph of the genus *Ranunculus* Linn. (Sp. Pl. 548: 1753 & Gen. Pl. ed. 5, 243: 1754) remains an outstanding desideratum. No satisfactory classification of the genus as a whole, even to sectional level, exists. For this one has to fall back on the account in De Candolle's *Prodromus* (i, 26-44: 1824) and the more recent synopsis in Engler & Prantl's *Pflanzenfamilien* (iii (2) 64-65: 1891), neither of which is at all satisfactory as the recognized groupings are inconveniently large.

There are, however, two regional accounts that are particularly relevant here: the very thorough revision of the North American species by L. Benson (*Amer. J. Bot.* xxvii, 799-808: 1940; *Amer. Midl. Nat.* xl, 1-261: 1948) in which particular attention is drawn to the neglected character of the nectary scale; and that of P. N. Ovczinnikov (in *Fl. U.R.S.S.*, vii, 332-509: 1937) in which there seems to have been an undue multiplication of subgeneric groups on a largely national basis; but many of these are invalid because they lack Latin descriptions. The foundation for this and other Russian accounts is the well-balanced revision of the Caucasian

Whether or not the rhizomatous species in Sect. *Ranunculus* are more advanced than the praemorse group is a difficult question to answer. All one can say is that in the Near East many of the species in the *Rhizomatosi* (e.g. *R. dissectus* M.B. s.l. and *R. crymophilus* Boiss. & Hohen.) are more highly evolved than any members of the *Praemorsi* in the same area. Sect. *Ranunculus* may well be the most primitive section of the genus, and it is perhaps significant that what appear to be the most primitive species of the Turkish *Rhizomatosi* are mesophytic woodland plants, just as the *Praemorsi* are almost confined to damp meadows and alpine pastures. Those species of *Rhizomatosi* found in dry rocky slopes and screes are morphologically more specialised, suggesting that the evolution of the section is related to adaptation to extreme or arid habitats.

J. L. Harper in his account of *R. acris* L. (J. Ecol. xlv, 289–342: 1957) has pointed out that there is no fundamental difference between the praemorse and the elongated rhizome, and that it is largely controlled by direction of growth and rate of decay. Nevertheless, it provides a practical way of dividing Sect. *Ranunculus* into two natural series, and is surprisingly constant so far as the Turkish species are concerned.*

3. *Grumosi*. *Perennials with dimorphic roots* borne on a very short stock (caudex?). These roots consist of fleshy storage roots (without any lateral rootlets), like a bunch of carrots, and filiform absorptive roots. The leaves are palmately lobed (*R. oxyspermus* Willd.) or often finely dissected, and many species have evolved densely hairy, 2–3-pinnatisect leaves; some species have heteromorphic basal leaves. The torus usually elongates markedly in fruit. The achenes are more specialised than in the *Praemorsi* and *Rhizomatosi*, and often bear hairs and tubercles, or have a winged margin; the dorsal margin is 1-nerved. In such highly advanced species as *R. isthmicus* Boiss. (*R. orientalis* auct. non L.) the base of the achene is produced into a flattened appendage and the long, hooked beak is compressed and falcate; the whole fruiting head is apparently dispersed like a burr. The nectary scale varies from a free flap (*R. macrorhynchus* Boiss.) to a deep narrow pocket (*R. isthmicus*).

Some species produce slender subterranean stolons (e.g. *R. cuneatus* Boiss. and *R. argyreus* Boiss.) but these are readily broken off so that their use as a diagnostic character is limited (cf. J. B. Crockett in Trans. Proc. Bot. Soc. Edin. xxxii, 415: 1938). The *Grumosi* contain the whole of Sect. *Ranunculastrum* DC. (which might be further subdivided on the basis of fruit characters†) and the monotypic Sect. *Physophyllum* Freyn (*R. bullatus* L.—a remarkable, autumn-flowering species with elliptical basal leaves).

* It may be pointed out that the characters used by Benson (Amer. Midl. Nat. xi, 25: 1948) to distinguish Sect. *Ranunculus* (as Sect. *Chrysanthé*) from Sect. *Epiroteles* (Prantl) Benson break down in the Middle East. *R. brachylobus*, for instance, which in its general affinities certainly belongs in Sect. *Ranunculus*, has a nectary scale attached to the middle (at least in subsp. *incisilobatus*), purplish sepals, and (in subsp. *brachylobus*) tubby achenes—characters treated by Benson as diagnostic of Sect. *Epiroteles*. Turgid achenes are found in *R. demissus* DC. and *R. dissectus* M.B., both of which have the nectary scale attached to the petal for at least half way. In none of these, however, is the torus manifestly elongated in fruit (the usual case in Sect. *Epiroteles*, although there are many exceptions), and there can be no doubt that the general affinities of all these species are with typical members of Sect. *Ranunculus*. The delimitation of the two sections needs study throughout their world range.

† Ovczinnikov (Fl. U.R.S.S. vii, 479–509: 1937) treats *Ranunculastrum* as a subgenus, and divides it into Sect. *Xiphocoma* (Stev.) Ovcz. and Sect. *Pterocarpa* Ovcz. (nomen).

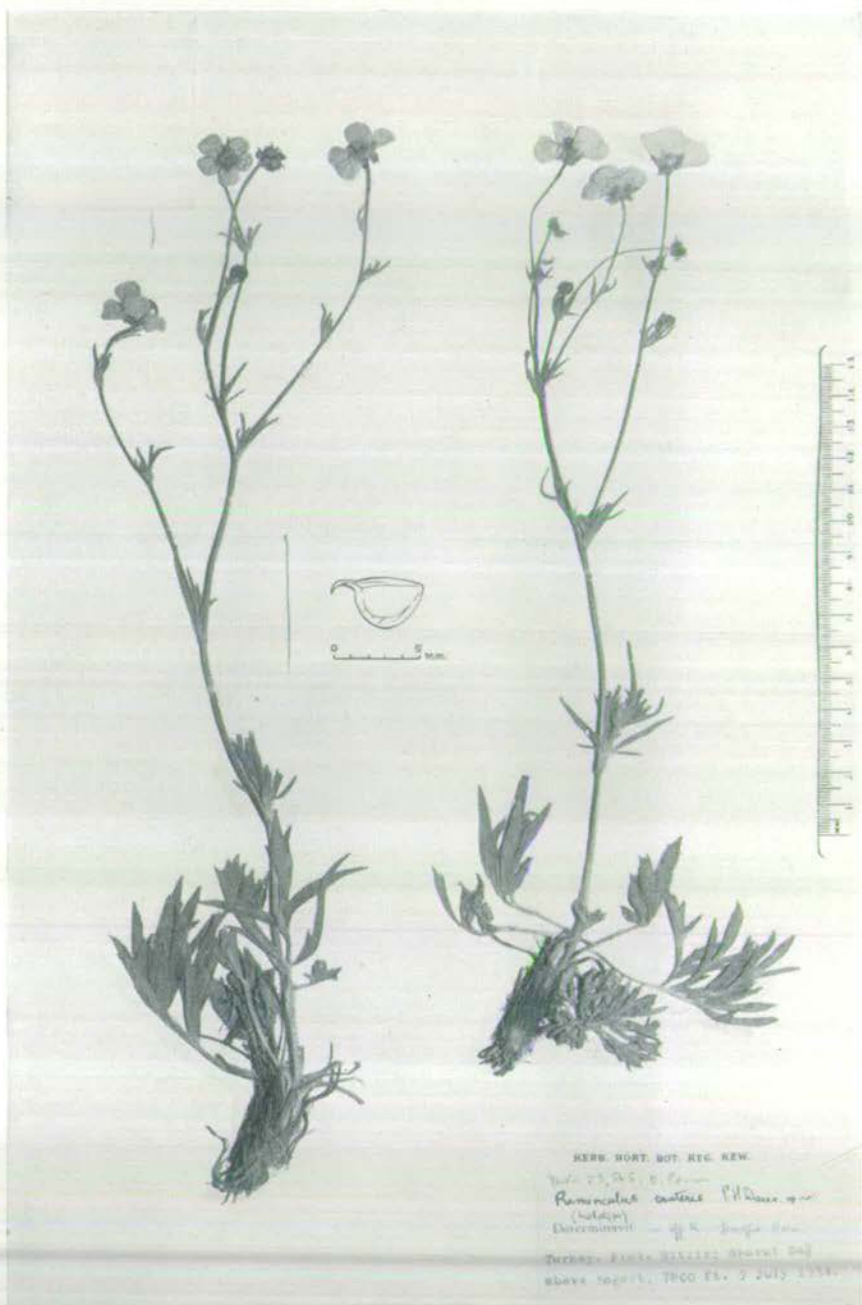
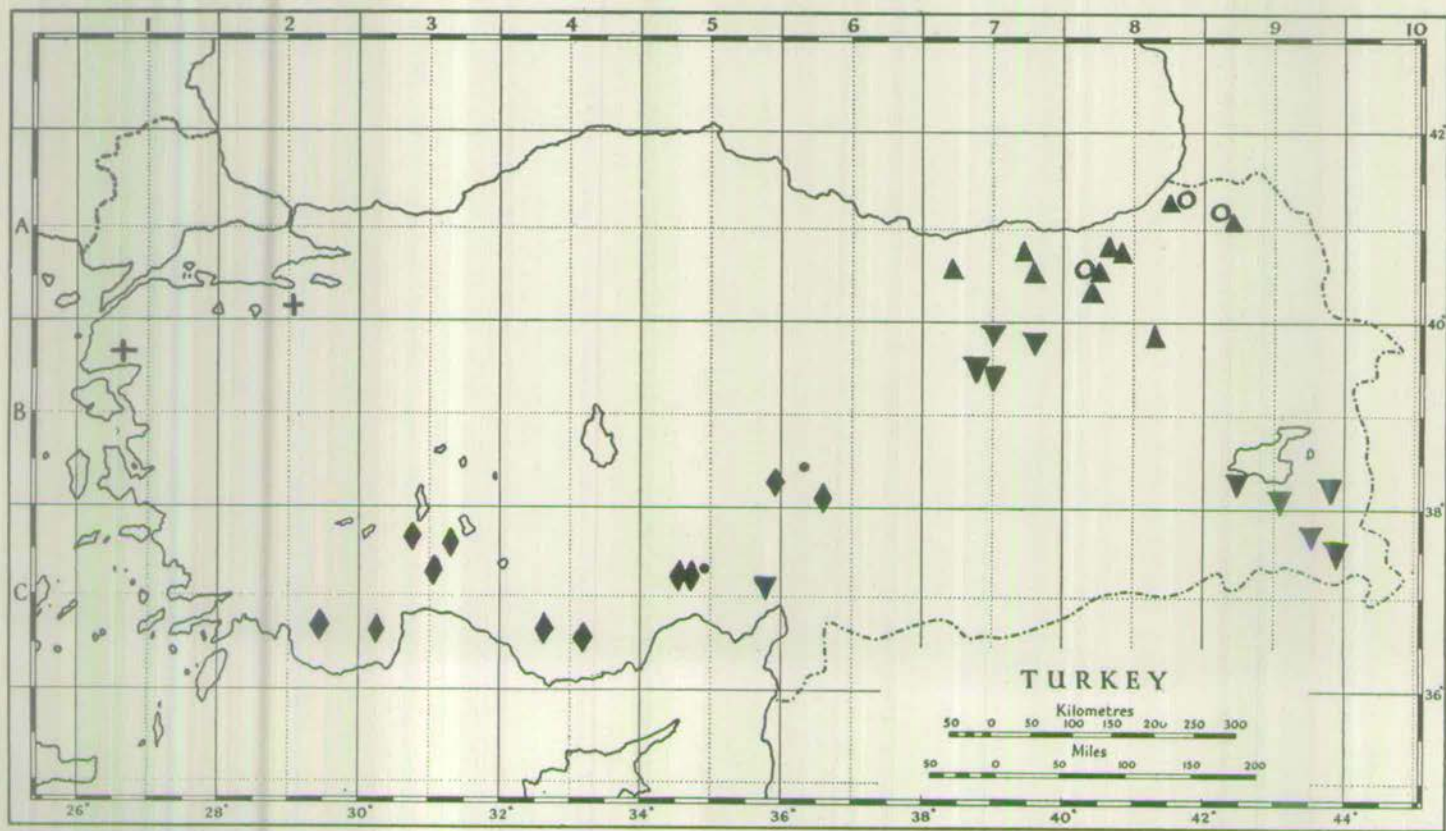


PLATE 6. *R. crateris* P. H. Davis (holotype).



MAP 2. Distribution in Turkey of species in group *Rhizomatosi*. + *R. sartorianus* Boiss. & Heldr. ○ *R. oreophilus* M.B. ▲ *R. brachylobus* Boiss. & Hohen. subsp. *brachylobus* ▼ *R. brachylobus* subsp. *incisilobatus* P. H. Davis ◆ *R. demissus* DC. var. *major* Boiss. ● Intermediate between *R. brachylobus* subsp. *incisilobatus* & *R. demissus* var. *major*.



PLATE 7. *R. poluninii* P. H. Davis (holotype).

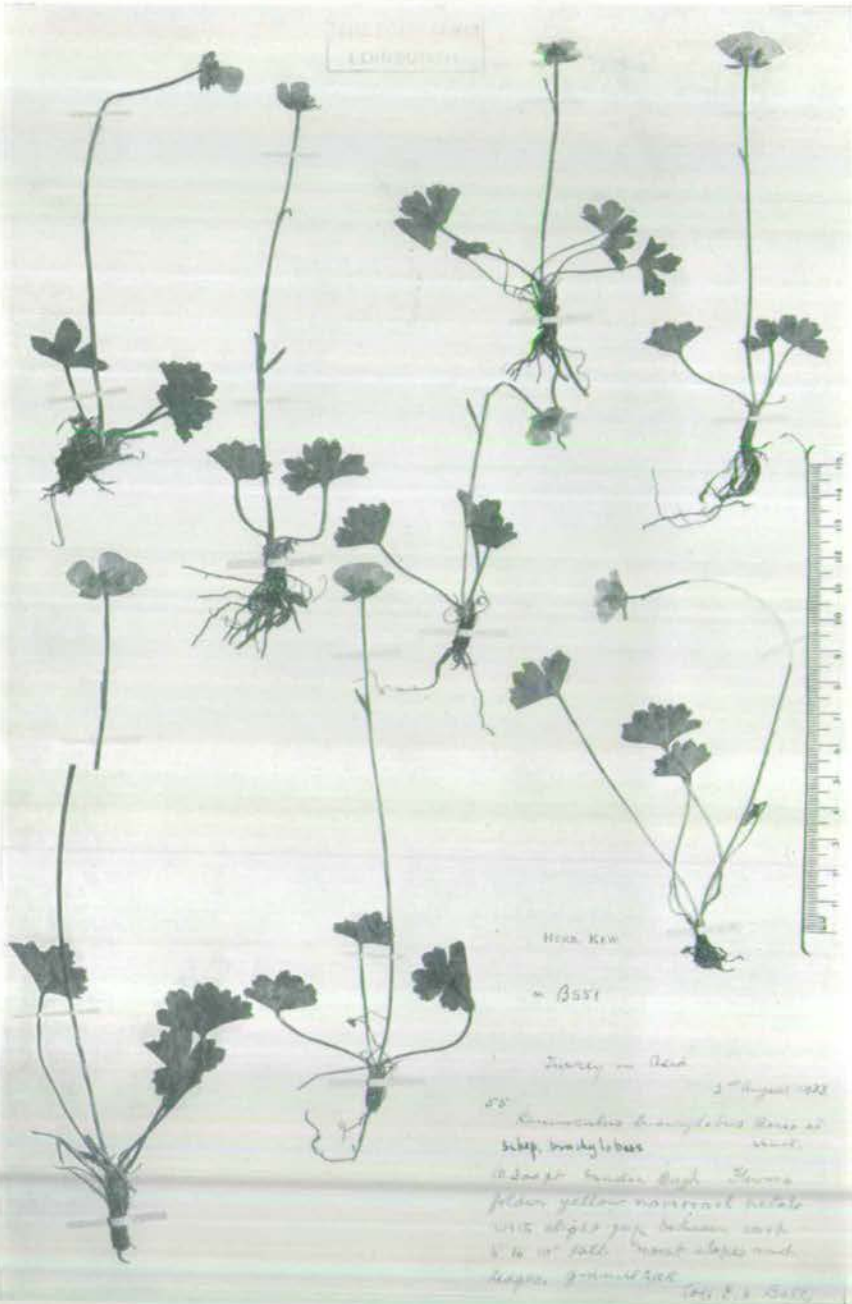
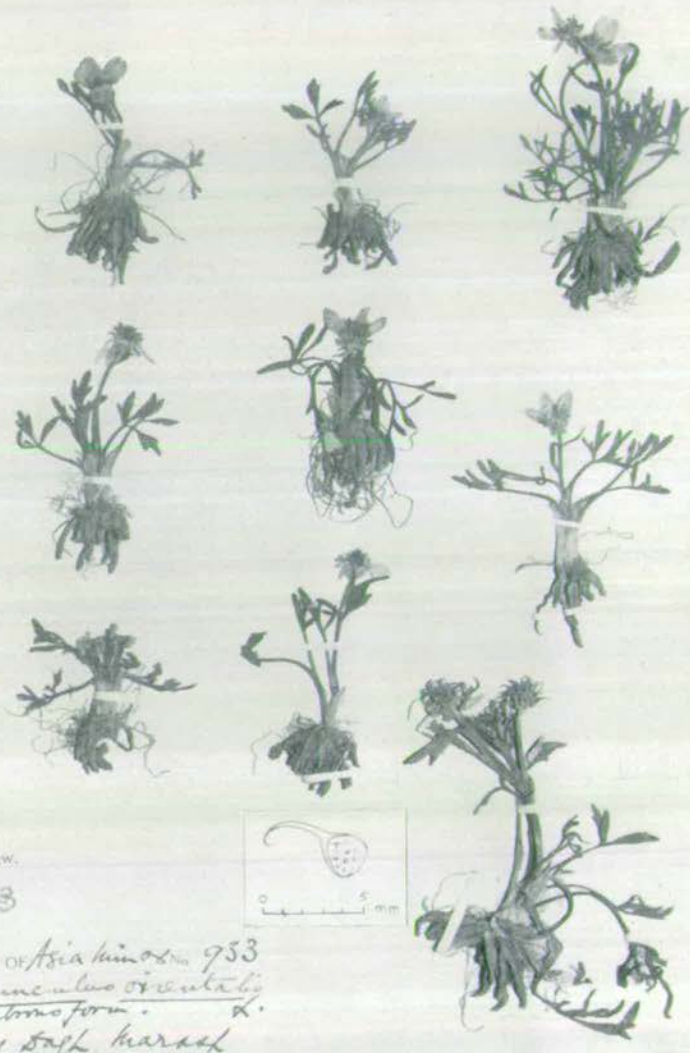


PLATE 8. *R. brachylobus* Boiss. & Hohen. subsp. *brachylobus* (Boiss. 551).



PLATE 9. *R. brachylobus* Boiss. & Hohen. subsp. *incisilobatus* P. H. Davis (holotype).

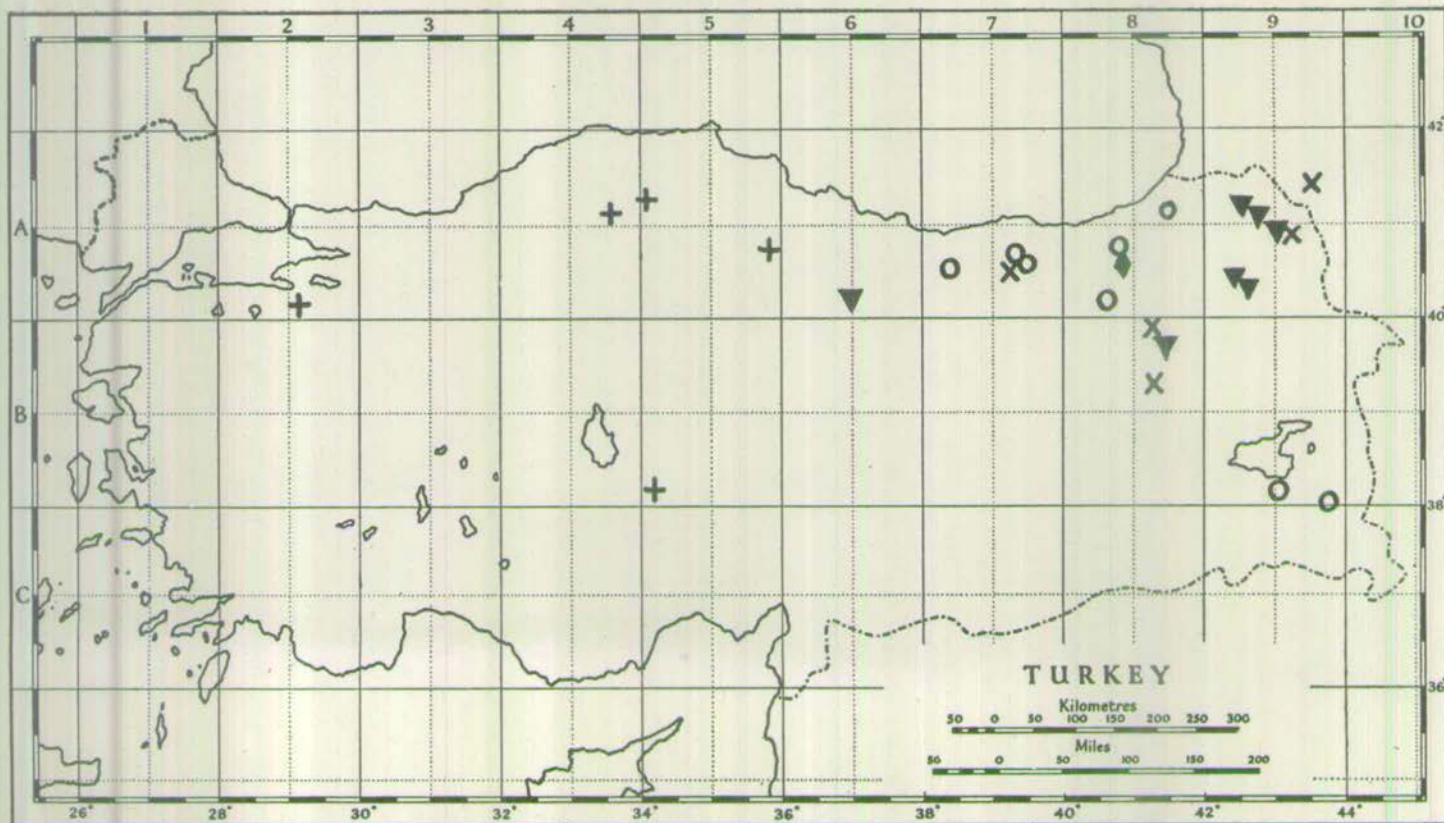


HERB. KEW.
6993

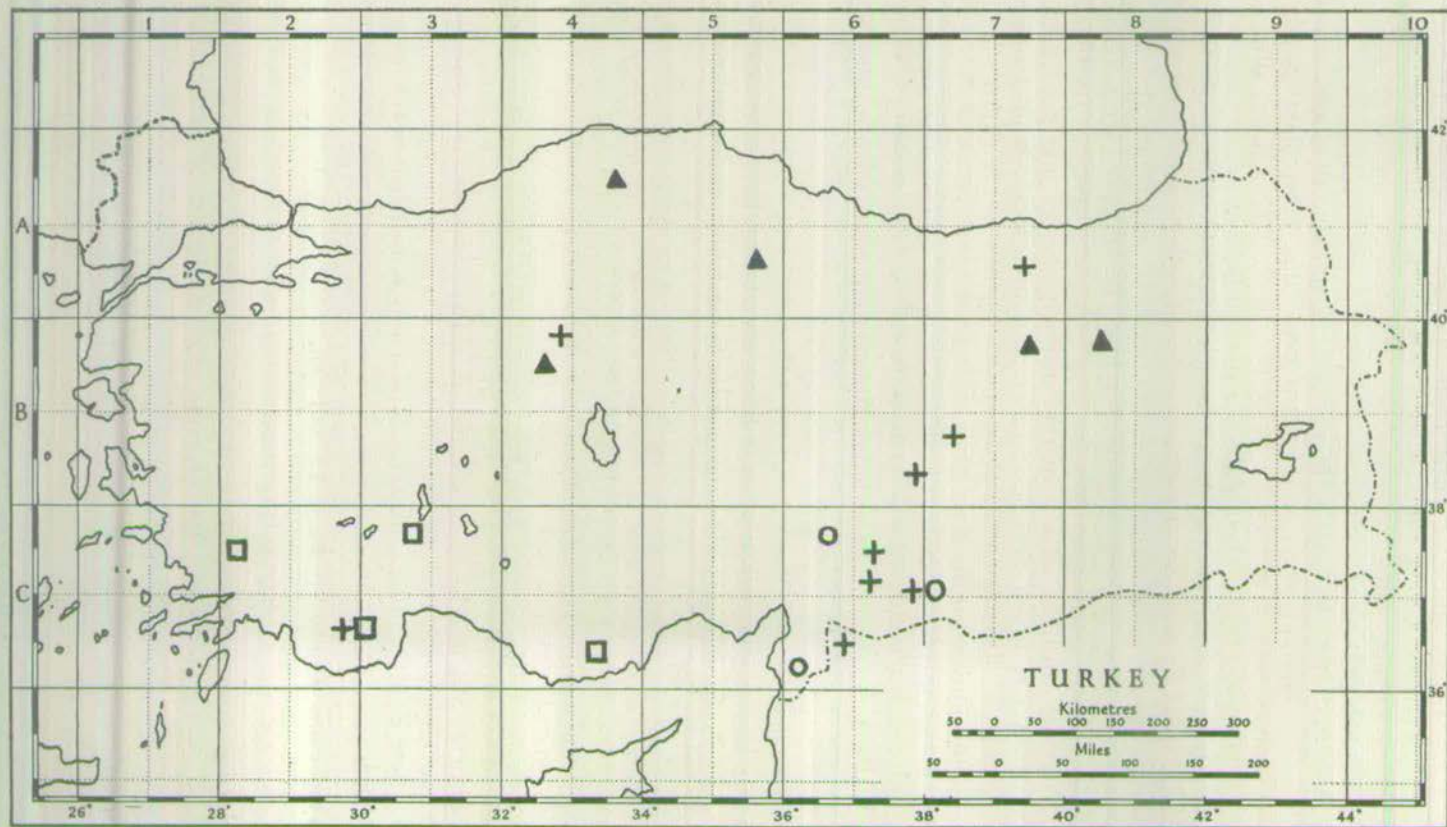
FLORA OF Asia Minor. 933
Ranunculus orientalis
glaberrimus
Khasak, Karakoram
5200'
Det. B. P. Ball, W. B. G. Purley. V. 1934

Ranunculus unguis-cati (H. B. K.) Greene
Determinavit Greene holotype

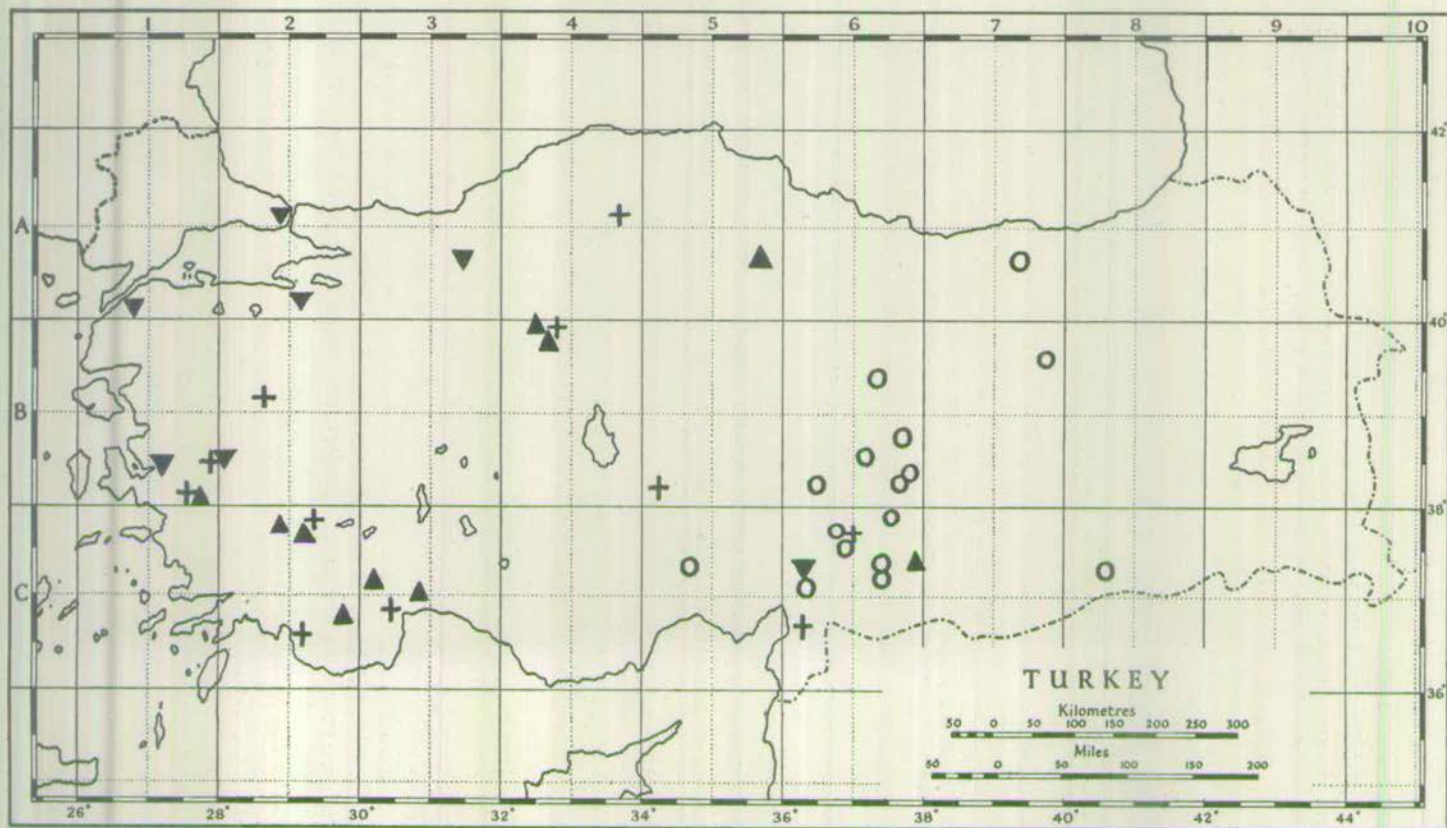
PLATE 10. *R. unguis-cati* P. H. Davis (holotype).



MAP 3. Distribution in Turkey of *R. dissectus* M.B., sensu lato. ▼ *subsp. napellifolius* (DC.) Davis ○ *subsp. huetii* (Boiss.) Davis
+ *subsp. sibthorpii* P. H. Davis × *subsp. glabrescens* (Boiss.) Davis ◆ *subsp. rigidulus* (Boiss.) Davis



MAP 4 Distribution in Turkey of species in group *Grumosi*. \square *R. sprunerianus* Boiss. \blacktriangle *R. oxyspermus* Willd. subsp. *oxyspermus*
 \circ *R. oxyspermus* subsp. *damascenus* (Boiss. & Gaill.) Davis var. *damascenus*. $+$ *R. oxyspermus* subsp. *damascenus* var. *pheygicus* (Boiss.) Davis



MAP 5. Distribution in Turkey of species in group *Grumosi*. ○ *R. cuneatus* Boiss. ▲ *R. argyreus* Boiss. + *R. reuterianus* Boiss.

▼ *R. rumelicus* Griseb.

BOOK REVIEW

British Brambles (review)*—In the "Handbook of British Rubi," by the late W. C. R. Watson, we have the most comprehensive work so far published on the complexities of the genus *Rubus* as represented in the British Isles, and it is the result of some forty years extremely close acquaintanceship with the group.

In it Mr. Watson has described 391 species, an increase of about 100 on the number he gave in the Check List of Vascular Plants (1946) and almost 300 more than the 103 species described by the Rev. W. Moyle Rogers in 1900. The main purpose of the work is to describe the multiplicity of forms in the genus as he has observed them, in correlation with western European species, and to provide a reasonably adequate systematic analysis for their identification as a basis for future research in other fields. The fact that he has upheld so many forms at equal specific level, while open to criticism, is perhaps outweighed by interests of convenience and the value of his detailed descriptions with their emphasis on unusual and interesting diagnostic characters.

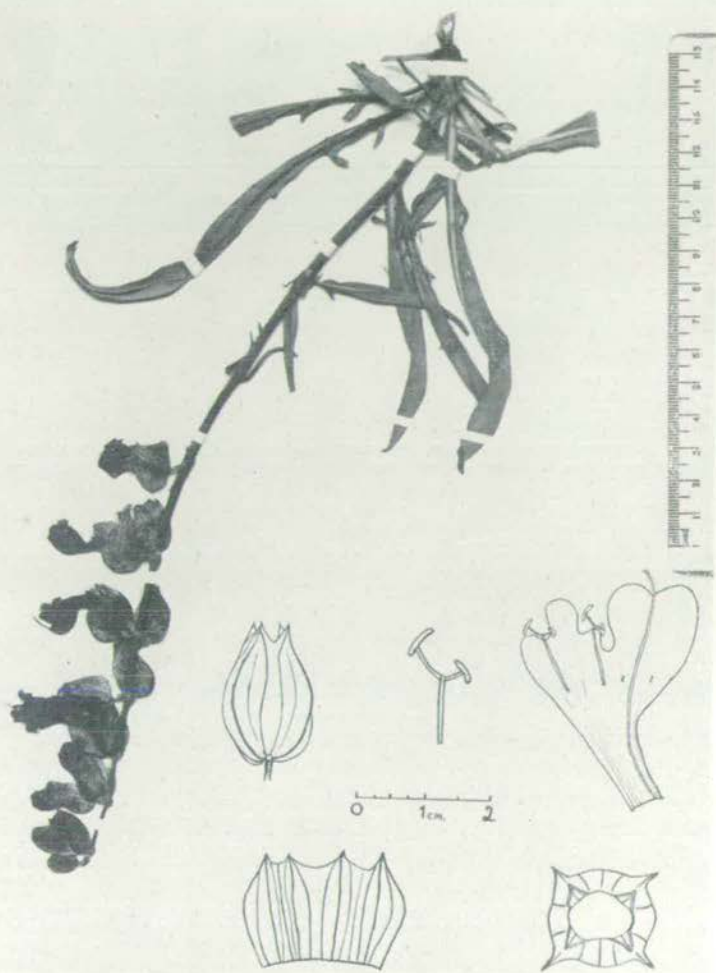
The conspectus of species preceding the descriptive text incorporates the group descriptions and is also an analytical key to the genus. It is interesting to note certain changes of arrangement from the previous conspectus of 1946. The five subgenera of *Cylactis*, *Chamaemorus*, *Idaebatus*, *Glaucobatus* and *Rubus* (*Eubatus*) are maintained, with a re-orientation of his major group of *Eubatus*. Two of the 12 sections of this subgenus, *Suberecti* and *Corylifolii* are removed to new hybrid subgenera *Idaebatus* \times *Rubus* and *Glaucobatus* \times *Rubus*. These are placed between the subgenera *Glaucobatus* and *Rubus* and the *Corylifolii* included in the section *Triviales* P. J. Muell. This might be more accurately cited as sect. *Triviales* P. J. Muell. pro parte, as Mueller and later authors included *R. caesius* in this section. The remaining ten sections are dispersed in the subgenus *Rubus* which now contains only 5 sections. Of these sections *Sylvatici*, *Discolores* and *Sprengeliani* remain basically unchanged, section *Hystrices* is united with the *Glandulosi*, and the remaining 5 are incorporated in section *Appendiculati* Gonev.

Throughout the text a general indication of the wider distribution of species in western Europe is given, in addition to the vice-comital distribution in the British Isles, as verified by the author. Mr. Watson has also mentioned the vice-counties in which he himself collected. It is a matter for regret that he was not personally acquainted with the Scottish *Rubus* flora, apart from herbarium material available to him in the south, and one feels that there is a wide field of investigation of the genus open in Scotland and the north of England. About 80 species have been authenticated by him as present in Scotland many of them based only on records from one or two vice-counties. Now, with the assistance of this valuable accumulation of experience, botanists in the north may be encouraged to investigate the distribution of species in Scotland more fully.

In addition to the descriptive text, analytical key and the very fine drawings which illustrate the work there are introductory chapters of general interest on the variation, genetics and distribution of *Rubus*; also useful advice on the collection of material for the herbarium. It is inevitable perhaps in the publication of uncompleted work to feel that ill-health prevented certain final adjustments and we can only be grateful to the editors and publishers for their clear presentation of this highly individual and vital contribution to the taxonomy of the genus. As Mr. Watson himself has said "If the classification here adopted is found to be involved and hard to grasp, well and good" for then it reflects the situation which exists in nature.

C. W. MUIRHEAD.

* Handbook of the Rubi of Great Britain and Ireland, by W. C. R. Watson. Cambridge University Press. 1958. Pp. xi+274, 50 figs. Price: 63 shillings.



DOPLA EX HERB. MUSEI HIST. NATUR. VIENNAE.
 K. u. k. botanisches Museum Wien

Salvia

Salvia pterocalyx - H. Amsel
 1958

1958

AFGHANISTAN

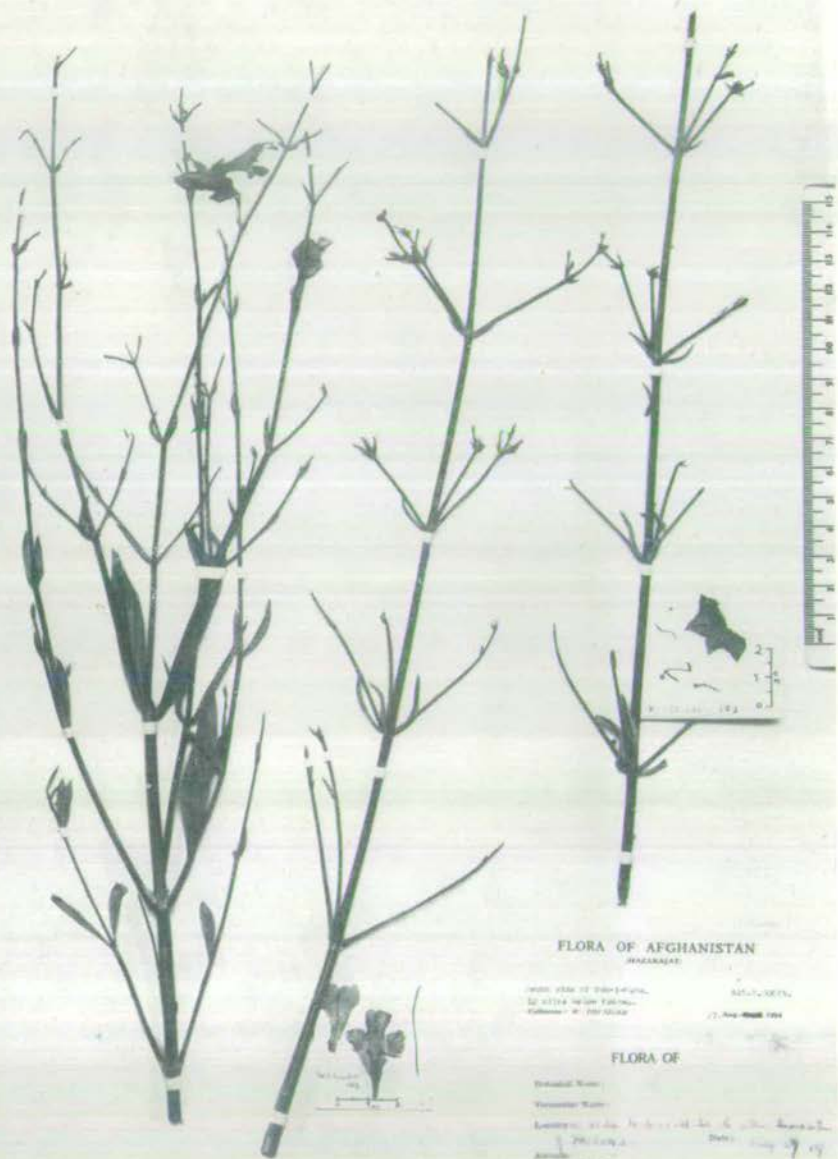
1958. H. J. Amsel. 1958

SALVIA PTEROCALYX I. C. HEDGE
 HOLOTYPE

Det. Ian C. Hedge
 E. J. H. 1958

Aug. 1959

PLATE 11. *Salvia pterocalyx* I. C. Hedge (Amsel s.n.).
 Inset: calyx in side view, opened out and from above (somewhat schematised),
 stamen and corolla.



FLORA OF AFGHANISTAN
KANDAHAR

1933, Aug. 17-18, 1933. S. C. HEDGE
 1933, Aug. 17-18, 1933. S. C. HEDGE

FLORA OF

Number of flowers: _____
 Number of whorls: _____
 Length of stem: _____
 Diameter of stem: _____
 Length of leaf: _____
 Width of leaf: _____
 Length of calyx: _____
 Length of corolla: _____
 Length of stamen: _____

Salvia tetradonta S. C. HEDGE

Herbarium

Det. S. C. Hedge

PLATE 12. *Salvia tetradonta* I. C. Hedge (*Thesiger* 103).
 Insets: dissections of calyx, corolla and stamens.

8

Extract from

NOTES FROM THE ROYAL
BOTANIC GARDEN
EDINBURGH

VOL. XXIII No. 4

(1961)

ARISTOLOCHIA IN THE NEAR EAST

P. H. DAVIS & M. S. KHAN

(University Department of Botany, Edinburgh.)

INTRODUCTION

Very little attention has been paid to the taxonomy of *Aristolochia* of the Near East. The main sources are Duchartre's monograph of the family in DC., Prodr., xv, (1): 421-498 (1864), Boissier's account in his *Flora Orientalis* (iv: 1074-1082 (1879)), and Sosnowsky's revision of the Georgian species (Not. Syst. Geogr. Inst. Bot. Tphilis., Acad. Sc. U.R.S.S.—Sect. Geogr., Fasc. 6:11 (1939)). A phyletic rearrangement of the *Aristolochiaceae* has been proposed by M. C. Gregory (Amer. Journ. Bot., xliii: 110 (1956)), and a claim, on teratological evidence, that the perianth of *Aristolochia* may be homologous with a vegetative leaf, has been put forward by J. W. Lorch (Evol. xiii, 3: 415 (1959)).

The present study is confined to the species from Greece (including the Aegean islands), Crimea, Turkey, Caucasus, Iran, Iraq, Syria, Lebanon, Palestine and Cyprus.

All the European and Mediterranean *Aristolochias* are placed by Schmidt (Nat. Pflanzenf. xvi: 240 (1935)) in Subsect. *Euaristolochia* Klotzsch (i.e., Subsect. *Aristolochia*, which includes the type of the genus, *A. rotunda* L.). The most closely allied group is apparently Subsect. *Andanthemum* Klotzsch which is widely distributed in the Tropics and subtropics of the Old World. All the European and Mediterranean species, with the exception of two lignified evergreen climbers (*A. semperirens* L. and *A. baetica* L.) are erect or diffuse herbaceous perennials, often with a tuberous root. The temperate Subsect. *Aristolochia* has presumably been evolved from an ancestral tropical (or subtropical) stock and represents, historically speaking, an ancient tropical element in the Mediterranean flora which has evolved its modern characteristics in relation to the establishment of the Mediterranean climate during the latter half of the Tertiary.

PHYTOGEOGRAPHICAL DISTRIBUTION

Subsect. *Aristolochia* has its centre of distribution in the Near East where by far the largest number of species (18) occurs in Anatolia. Most of the species are mesophytic and very local. In Anatolia only the xerophytic *A. maurorum* L. can be described as a common, probably invasive species. The accompanying table summarises the phytogeographical distribution of the Near East species almost throughout their whole range; parenthesis indicate that the species extends only exceptionally into that region. It will be seen that the maximum concentration of species is in the Mediterranean region (*sensu stricto*); indeed 22 out of the 25 species occur there, and 13 are confined to it. These include a wide range of morphological types, whereas most of the species growing in the other

three areas (Central European, Hyrcano-Colchic and Irano-Turanian) and closely allied to other species within those areas and the Mediterranean. This suggests that the main diversification of the subsection has taken place within the Mediterranean region, and probably in its eastern part.

Distributional maps for some closely allied species are given in the text. These are based (except for some type localities) on material examined.

Table showing the distribution of the Near East species of *Aristolochia* according to phytogeographical regions:

<i>Species</i>	* <i>Central European</i>	* <i>Hyrcano-Colchic</i>	<i>Mediterranean</i>	<i>Irano-Turanian</i>
1. <i>sempervirens</i>	—	—	+	—
2. <i>iberica</i>	—	+	—	—
3. <i>billardieri</i>	—	—	+	—
4. <i>brevilabris</i>	—	—	+	—
5. <i>steupii</i>	—	+	—	—
6. <i>hyrcana</i>	—	+	—	—
7. <i>pontica</i>	—	+	(+)	—
8. <i>cretica</i>	—	—	+	—
9. <i>bodamae</i>	—	+	+	—
10. <i>hirta</i>	—	—	+	—
11. <i>auricularia</i>	—	—	+	+
12. <i>paecilantha</i>	—	—	+	(+)
13. <i>bottae</i>	—	—	(+)	+
14. <i>olivieri</i>	—	—	+	—
15. <i>maurorum</i>	—	—	(+)	+
16. <i>cilicica</i>	—	—	+	—
17. <i>lycica</i>	—	—	+	—
18. <i>stenosiphon</i>	—	—	+	—
19. <i>incisa</i>	—	—	+	—
20. <i>clematitidis</i>	+	+	+	(+)
21. <i>rotunda</i>	+	—	+	—
22. <i>pallida</i>	+	+	+	—
23. <i>longa</i>	—	—	+	—
24. <i>parvifolia</i>	—	—	+	—
25. <i>microstoma</i>	—	—	+	—

* The Central European and Hyrcano-Colchic areas should probably be treated as provinces of the Euro-Siberian region, co-ordinate with the Mediterranean and Irano-Turanian regions, as will be elaborated in a later paper. P.H.D.

SPECIFIC CRITERIA AND VARIATION

Root: the shape of the main (primary?) root—globose, ovoid, elongated and cylindrical, fusiform or napiform—is a constant character of great importance in the delimitation of species. Two species have slender roots that arise from a rhizome (*A. pistolochia* L. and *A. clematitidis* L.).

Leaf: there are three basic types of leaf shape:— (1) cordate-ovate with rounded sides, (2) cordate-deltoid with straight sides, and (3) lanceolate or linear-lanceolate with a biauriculate base. Within these three limits there are minor variations which constitute important diagnostic characters in most of the species. Length of the petiole, size and shape of the auricles, and their posture (straight, diverging, incurved, or horizontal) leaf margin (entire, crenate, sinuate, undulate or cartilaginous-denticulate)

with rounded obtuse auricles 2–4.5 cm. broad, apex usually more or less pointed (rarely obtuse), papillose or more or less pubescent below; petiole 1–6.5 cm. long. Flowers solitary, axillary, large. Peduncles 1.5–5 cm. long. Perianth greenish purple and sparsely hirtellous or hirsute outside, 5.5–11 cm. long; utricle inflated, very broadly oblong, 1.5–2.3 cm. long, 1–1.7 (–2.5) mm. wide; tube U-curved, 5–15 mm. broad at base, gradually dilated towards the top and 12–30 mm. broad; limb cordate-ovate, 25–60 mm. long, glabrous or hirtellous inside, purplish brown (?) with purplish mottling, apex acute or obtuse, the lower rim divided early to the base into 2 obtuse 1–2 cm. long auricles, throat bearing whitish hairs on its lower side. Ovary oblong-clavate, hirsute. Capsule broadly oblong or pyriform, c. 2.5 × 1.7 cm., pubescent and often with longer scattered hairs. Fl. April-May.

in damp shady places and on sheltered river banks, up to 1500 m.

type: Levant, *Tournefort* (P, n.v.).

CAUCASUS. Prov. Batum, *Massalsky*. Prov. Batum, ad. stat. viae ferrae Zakwa, in sylvis, Apr.-Mai. 1904, *Novopokrovsky* 33 (LE). Imeretia: Schoroch, 19 Apr. 1893, leg.? In ruderalis oppide Jurienti, in umbrosis humidis, *Wittmann* (LE). Georgia: Tolakh-Kordan, 800 m., 3 June 1893, *Alboff* 122.

TURKEY. Lazistan: forets des environs de Rhize, May 1866, *Balansa* 357; Ayeli (E. of Rhize), 2 April 1939, *Guichard* T/18/1959. Prov. Ordu: S. of Aniye and Zigara, 900 m., 13 May 1960, *Synge & Furse* 118. "Plantae rapesondensae", *Turkevicz* a. 1916-1917 (LE). Prov. Giresun: Tamdere—Meslakkaya, Blokchuttflur 4 km. nördlich Tamdere, 1480 m., 1 Jul. 1955, *Süber-Morath* 14255. Erzeroum (Erzurum—Trabzon?), *Zohrab*. Bithynia (Prov. Adapazari): Sabandscha (Sabanja), 14/15 May 1835, *Wiedemann*. Prov. Bolu: Abant-See nw. von Bolu: 1100 m., 18 May 1958, *F. Markgraf*. Prov. Bursa: Olympus—Geukdere, 1500-4000 m., 28 Jun. 1893, *B.V.D.* Post (G).

LEBANON. Abeih (33.45 N, 35.32 E), Post 656 (BM, as *A. hirta*).—Endemic to the countries cited above.

A. pontica is closely allied to *A. cretica* Lam. from which it differs in its very deeply biauriculate perianth limb and larger, usually glabrescent leaves that are bigger than the flowers. In *Guichard*'s specimen the limb is exceptionally acute.

Post's specimen from the Lebanon is the first record for this species outside the Hyrcano-Colchic province, although several species (e.g. *Rhododendron ponticum* L.) show a similar disjunction. The Lebanon specimen has somewhat more hairy leaves and flowers than is usual in Colchic material. The Bithynian specimens mark a considerable extension of its known Black Sea range.

Sosnowsky is wrong in describing the rootstock of *A. pontica* as globose—at least as far as *Balansa*'s specimen at Geneva is concerned.

Note:

What appears to be a distinctive new species, probably related to *A. pontica*, was photographed in colour by Mr. K. M. Guichard at Ergiz in Turkish Lazistan. This differs from *A. pontica* in its smaller flowers and utricle, more slender tube and very hairy ovate orbicular limb with a ciliate margin, shortly 3-lobed below and emarginate above, and in its shortly petioled, deltoid (straight sided) leaves. In leaf shape it resembles *A. hirta* but the flower structure is different.

8. *A. cretica* Lam., Encyc. i, 255 (1783). Boiss., Fl. Or. iv, 1081 (1879). Ann. Mus. Hist. Nat. Paris, x, t. 18 (1807); Joh. Kerner, Hort. Sempervi t. 336 (1811).

Root cylindrical. *Stems* simple or branched, decumbent or erect, 15–cm. tall, hirsute. *Leaf lamina* 25–55 mm. long and 20–60 mm. broad, reniform-cordate to cordate-ovate, paler beneath, hirtellous, margin entire or crenulate, apex acute, obtuse or retusé, often mucronate, auricles round, incurved; petiole 5–30 mm. long. *Flowers* axillary, solitary, always larger than leaves. Peduncles longer than petioles (25–65 mm.). *Perianth* 5–12 cm. long, greyish brown and hirsute outside; utricle obovate-oblong, 12–25 mm. long and 9–23 mm. broad; tube U-curved, 7–15 mm. long, broad at the base, gradually dilated above up to 9–25 mm.; limb ovate-oblong, shorter than tube (18–45 mm.), purplish brown and hirsute with white hairs inside, apex obtuse or retuse, base with 2 small (2–5 mm. long), obtuse auricles. *Ovary* oblong-clavate, hirsute. *Capsule* elliptic-oblong, 3–4 cm. long, hirsute. Fl. March-May.

In screes and in shady places among rocks, ascending to 600 m.

Type: Isle de Candie [Crete], *Tournefort* (P, n.v.).

CRETE. Malaxa: prope Canea, 300 m., 3 May 1938, *Davis* 144; lieux arides, 7 May 1883, *Reverchon* 156. Epanochoria (dist. Hierapetra) 90 m., 12 May 1938, *Davis* 162. Mt. Kavutsi (dist. Sitia), 150–300 m., 14 March 1940, *Davis* 1276; supra Kavutsi, 600 m., Sept. 1938, *Davis* 1276. Dist. Mirabello, prope 'Kritsa', May 1900, *Leonis* 437. Kissamos: lieux arides, 13 Apr. 1884, *Reverchon* (156?).

RHODES. Montis Attairo, 600 m., 16 May 1935, *Rehinger* fil. 731 (sterile); Monte Prophet Elias (Monte Profeta), prope Salakos, 600 m., 11 Mai 1935, *Rehinger* fil. 7110; montes Akramiti, 600 m., 19 Mai 1935, *Rehinger* fil. 7456. Also recorded from Karpathos.—*Endemic*.

Very close to *A. pontica* Lam. from which it differs in its more rounded pubescent leaves which are smaller than the flowers, and perianth with shortly biauriculate limb.

9. *A. bodamae* Dingler in Flora, lxvi, 301 (1833). Map 1.

Root cylindrical, 15–20 cm. long and c. 1.5 cm. thick. *Stems* shortly hirtellous, flexuose, simple. *Leaf lamina* 5.5–14 cm. long and 3.5–12 cm. broad, subdeltoïd to cordate-hastate, obtuse or acute, mucronulate, paler beneath, shortly hirtellous on both sides, base cordate with widely open sinus, auricles large, subrotund and subincurved; petiole 0.5–3.5 cm. long. Peduncles 3–4 cm. long. *Perianth* (in open flower) 7–8 cm. long, hirtellous and blackish green outside; utricle broadly oblong or ovate-oblong, 8–12 mm. long; tube cylindrical, U-curved, 3–4 mm. broad at base, gradually dilated above to 7–9 mm.; limb 3–4 cm. long and 2.5–3.4 cm. broad, peripherally concave, cordate-ovate, obtuse, base broadly cordate, the triangular sinus 6–8 mm. deep, inside dark purple with paler spots at the tip. *Ovary* 1–1.5 cm. long, linear to subclavate, densely hirsute. *Capsule* not known. Fl. May-June.

Deciduous forest, shady places and fallow fields, up to 1200 m.

Type. Greece: in umbrosis nec non in cultis (solo arenoso) vallis riv. "Bodama Su" inter portum Dedeaghatsch dictum et pagum Chyrk Thraciae meridionalis haud raro, 5 Mai 1876, *Dingler* (B—destroyed).



PLATE 1. *Centaurea ensiformis* P. H. Davis.

to face page 68]

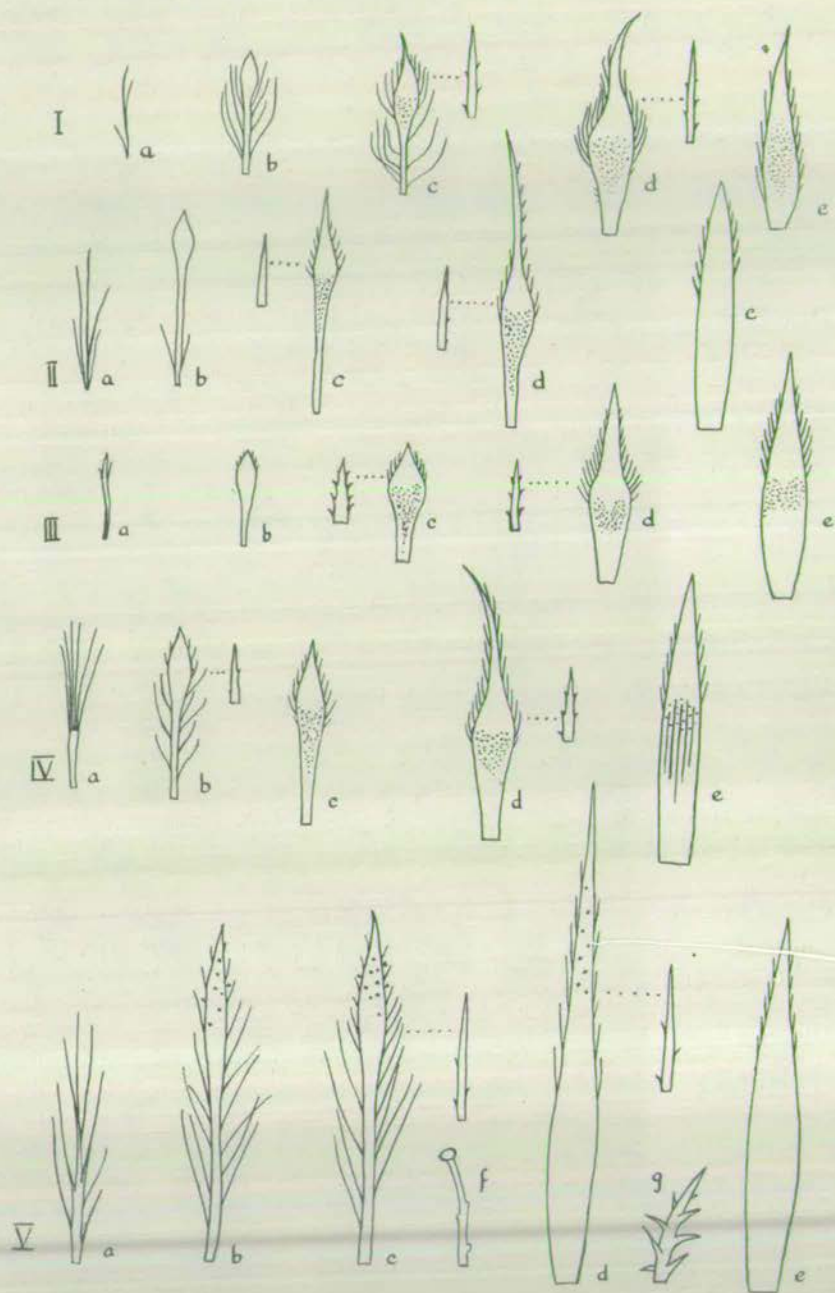


FIG. 1. Involucres of species of *Echinops*. I, *E. pamosus* Rech. fil. (type). II, *E. heterophyllus* P. H. Davis (type). III, *E. Onopordum* P. H. Davis (D. 14213). IV, *E. Tournefortii* Led. (type). V, *E. Emiliae* P. H. Davis (D. 13651). a, setae of 'pencil'; b-c, outer phyllaries (with marginal setae); d, median phyllaries (with marginal setae); e, inner phyllaries; f-g, leaf hairs. All $\times 1\frac{1}{2}$.

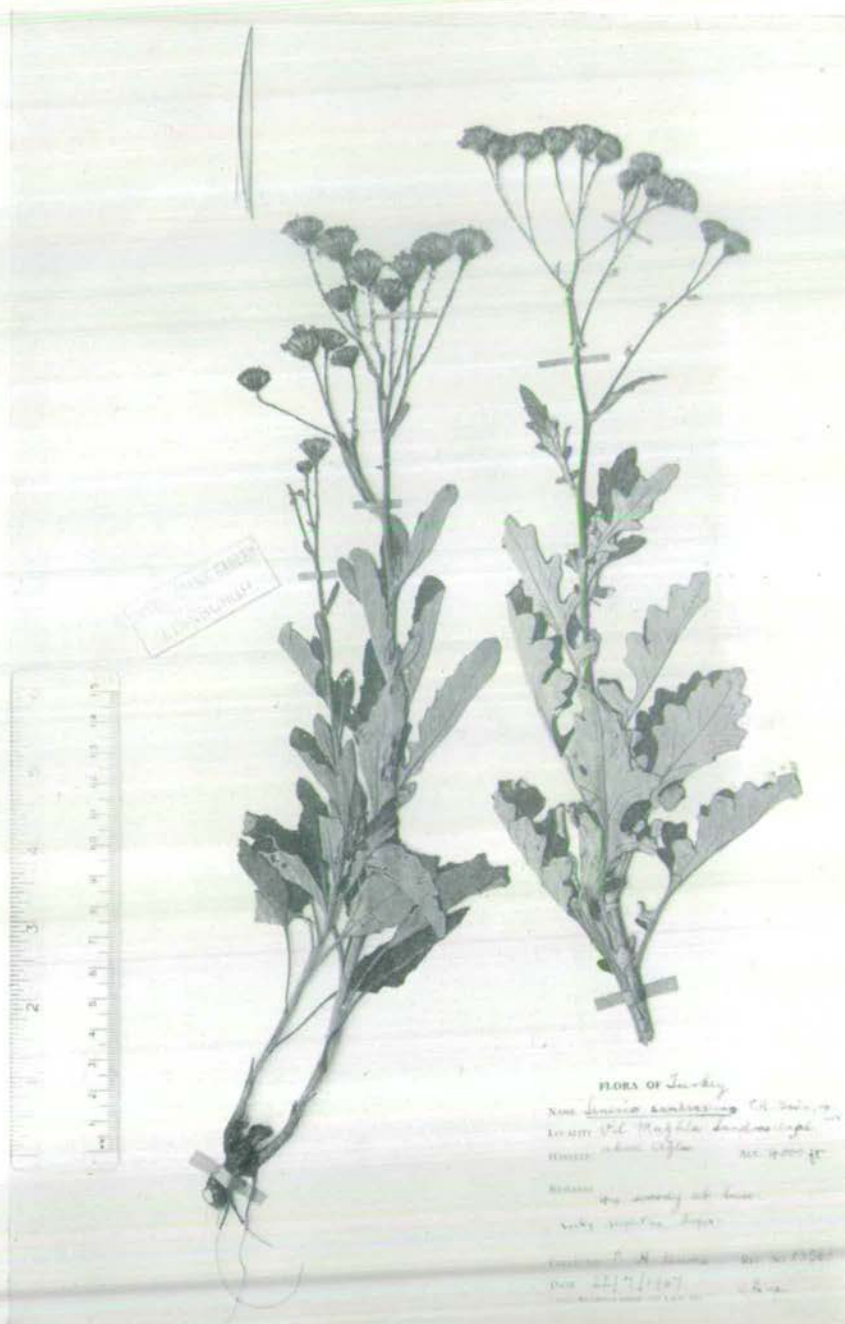


PLATE 2. *Senecio sandrasicus* P. H. Davis.



Herb. Type specimen

Slack

HERB. HORT. BOT. HEG. KEW.

Helichrysum chasmolyticum P. H. Davis
 In the Prov. Antioquia (Cocle) Dept. Dept.
 near the station between Medellin and
 Santa Fe 1000 m. summit of volcanic
 hanging cliffs dominant phylla
 lanceolate

1912-1913 P. H. Davis (1912) coll.



PLATE 3. *Helichrysum chasmolyticum* P. H. Davis.

Whereas *T. tubulosa* grows from near sea-level (Beirut) to 1,300 m., the new species occurs at 1,500–1,700 m. in Cilicia Trachea, and *T. fruticulosa* at 1,800–2,200 m. in the west part of the Lycian Taurus. *T. antilibanotica*, confined to the high Anti-Lebanon (2,400–2,600 m.) is less closely related but may well be derived from the same stock.

While investigating the status of *T. pubicalyx*, I came across type material of *Campanula Shephardi* Post. There is no doubt that this is a *Tracheliopsis*, and that it is very closely related to *T. Postii* Boiss. (described from Hamath in N. Syria) of which the holotype has kindly been sent on loan from Geneva. No mention is made of *C. Shephardi* by Dinsmore in the 2nd edition of Post's Flora of Syria, Lebanon and Sinai, but the citation of "Amanus" under *T. Postii* suggests that Dinsmore may have considered *C. Shephardi* (described from "Amanus") to be the same plant. So far as flowering material is concerned, both taxa are known only from single gatherings. *T. Postii* is unique in its genus in having toothed sepals—often a good taxonomic character in *Campanula*; it also has a shorter inflorescence and smaller flowers than those of *C. Shephardi*. Flower size, however, shows considerable variation in *T. tubulosa*. In other characters the two taxa appear identical, and cannot be distinguished out of flower. Provisionally I prefer to treat *C. Shephardi* as a subspecies of *T. Postii*—a species very distinct in habit from other species in the genus—and make the new combination here:—

***Tracheliopsis Postii* (Boiss.) Buser subsp. *Shephardi* (Post) P. H. Davis, comb. et stat. nov.**

Syn. *Campanula Shephardi* Post in Bull. Herb. Boiss. i, 25 (1893).

The content and affinities of this very natural but ill-defined genus were discussed by the writer in Hooker's *Icones Plantarum* (tab. 3498 : 1950). Here is a key to the seven taxa now included within it:—

1. Style exerted:

2. Calyx glabrous:

3. Leaves oblong-elliptical, 10–30 mm. long; stems 8–20 cm.; inflorescence many-flowered *T. tubulosa* (Boiss.) Buser
3. Leaves orbicular, up to 4 mm. long; stems 1–2.5 cm.; inflorescence few-flowered *T. antilibanotica* Davis

2. Calyx hairy:

4. Corolla lobes nearly as long as tube; leaves grey-tomentose below, median ones over 3 cm. long:
5. Sepals toothed; inflorescence as broad as long; corolla 8–10 mm. long *T. Postii* (Boiss.) Buser subsp. *Postii*
5. Sepals entire; inflorescence oblong; corolla 12 mm. long *T. Postii* subsp. *Shephardi* (Post) Davis
4. Corolla lobes much shorter than tube; leaves adpressed-pubescent or glabrescent below, less than 2 cm. long.
6. Calyx villosulous; leaf length $1\frac{1}{2}$ –2 × breadth *T. fruticulosa* Schwarz & Davis
6. Calyx minutely pubescent; leaf length 4–6 × breadth *T. pubicalyx* Davis

1. Style included *T. myrtifolia* (Boiss. & Heldr.) Schwarz & Davis

BORAGINACEAE

***Alkanna Attilae* P. H. Davis, sp. nov.**

Affinis *A. incanae* Boiss. sed basi magis ramosa procumbente, indumento foliorum monomorphico e pilis longis adpressis composito, nuculis paulo longioribus minus abrupte curvatis rostro brevioribus recedit.

Herba perennis, alpina, haud violaceo-tincta. *Caudices* prostrati vel procumbentes, ramosi, inter lapides elongati, laxe multirosulati, cortice deinde nigricante. *Folia rosularum* oblanceolata, acuta, in petiolum sensim attenuata, 2.5–5 (7) cm. longa, 3–7 (11) mm. lata, uninervosa, pilis albis monomorphis incurvis vix 1 mm. longis sub lente minutissime papilliferis adpresse strigulosa, canescentia. *Caules* floriferi procumbentes, simplices, ad inflorescentiam bifidi, 3–7 cm. longi, pilis patentibus incurvis hispiduli, in cincinnum densum fructiferum 3–6 cm. longum abeuntes. *Folia caulina* lineari-oblonga, obtusa vel subacuta, sessilia, 10–15 (30) mm. longa, 2–5 (8) mm. lata, indumento ut in foliis rosularibus et bracteis et calycibus vestita. *Bracteae* lineari-oblongae, calyce $1\frac{1}{2}$ –2-plo longiores. *Calyx* 6 mm. longus, in lacinas lanceolato-lineares obtusiusculas adpresse strigulosas fissus, pedicello longior, in fructu ad 8 mm. longus. *Corolla* 12–15 mm. longa, glabra; tubus brunneo-aurantiacus, 9–11 mm. longus, 2 mm. latus; limbus azureus vel violaceo-azureus, patens, in lobos orbiculatos 2.5–3.5 mm. longos divisus. *Antherae* biseriatae, ellipticae, 1.25 mm. longae, in dimidium tubi superius insertae. *Stylus* 4–8 mm. longus. *Nuculae* valde incurvae, 2.5 mm. longae, 2.0 mm. latae, ex toto verruculis minimis concis basi inter se distinctis dense obsitae, rostro deorsum sensim flexo, hilo haud stipitato, areola sinum occupante.—Fl. Jun.–Jul.

PROV. ANTALYA. Dist. Kemer (Lycia): Tahtali Dağ, 2,100–2,300 m., perennial, flowers blue-violet with golden brown tube, 10 July 1949, *Davis, Attila & Bilger* (D. 15059, holo. K; iso E); Çalbali Dağ (Bereket Dağ), 2,000–2,100 m., among rocks, fl. blue (azurea), 14 July 1949, *Davis, Attila & Bilger* (D. 15279).

A. Attilae is closely related to *A. incana* Boiss. and *A. areolata* Boiss., both being endemic to S.W. Anatolia. It differs from both in having a monomorphic indumentum, the leaves being covered with rather long sturdy adpressed hairs only (in the other two species these have beneath them an undercoat of very short hairs); in its much-branched decumbent base; and in its slightly longer (but not wider) nutlets which are more gradually curved, with a shorter, curved (not straight) beak. It differs further from *A. areolata* in its adpressed indumentum, somewhat shorter broader calyx segments, shorter flowering stems, and nutlets covered with minute, conical (instead of hemispherical) warts.

A. incana and *A. areolata* are very closely related; gatherings from Dedegöl Dağ in Pisidia (*Davis* 16060, *Davis* 16073) are intermediate between these two taxa; as their areas largely overlap, it is possible that hybridisation occurs. At any rate, their specific distinctiveness is perhaps open to question. So far as I know, they both grow at lower elevations than *A. Attilae*.

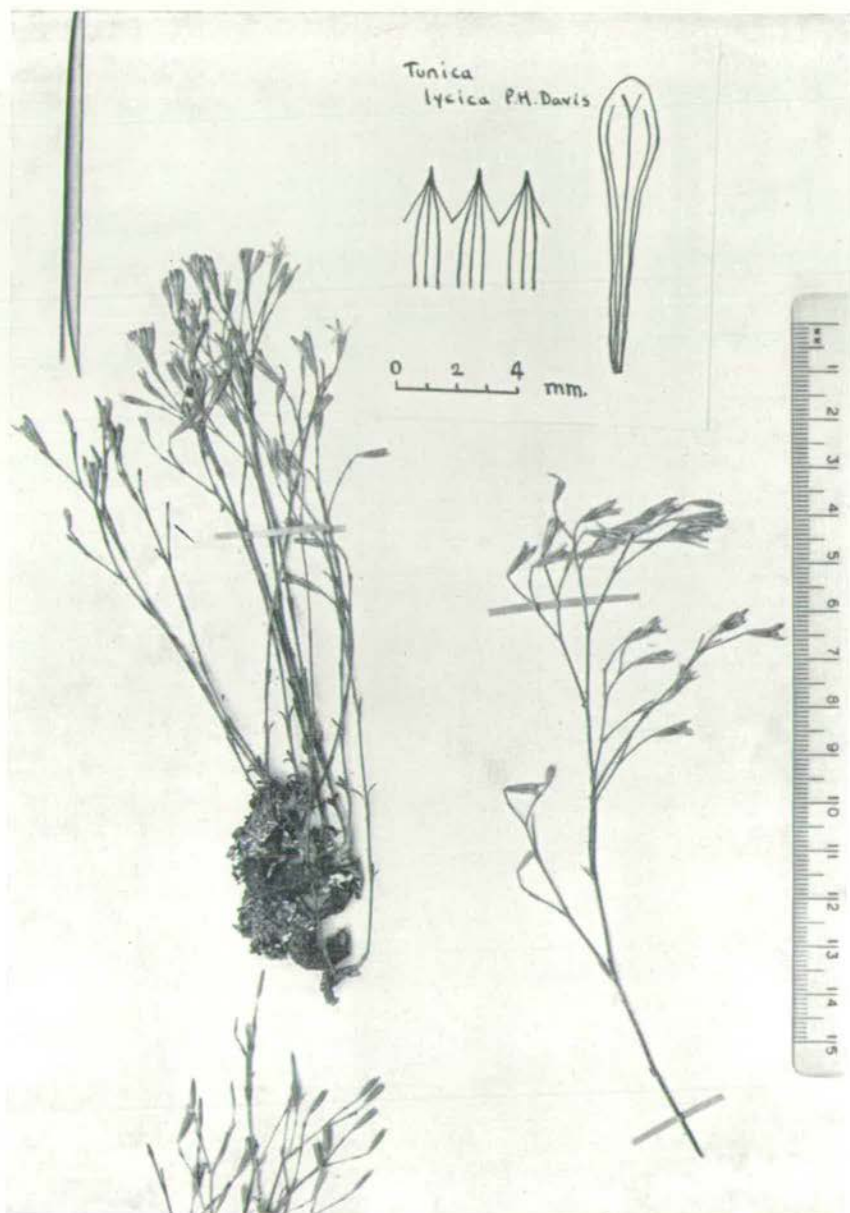


PLATE 9 *Tunica lycica* P. H. Davis. (D. 13675.) Inset : calyx teeth and petal.

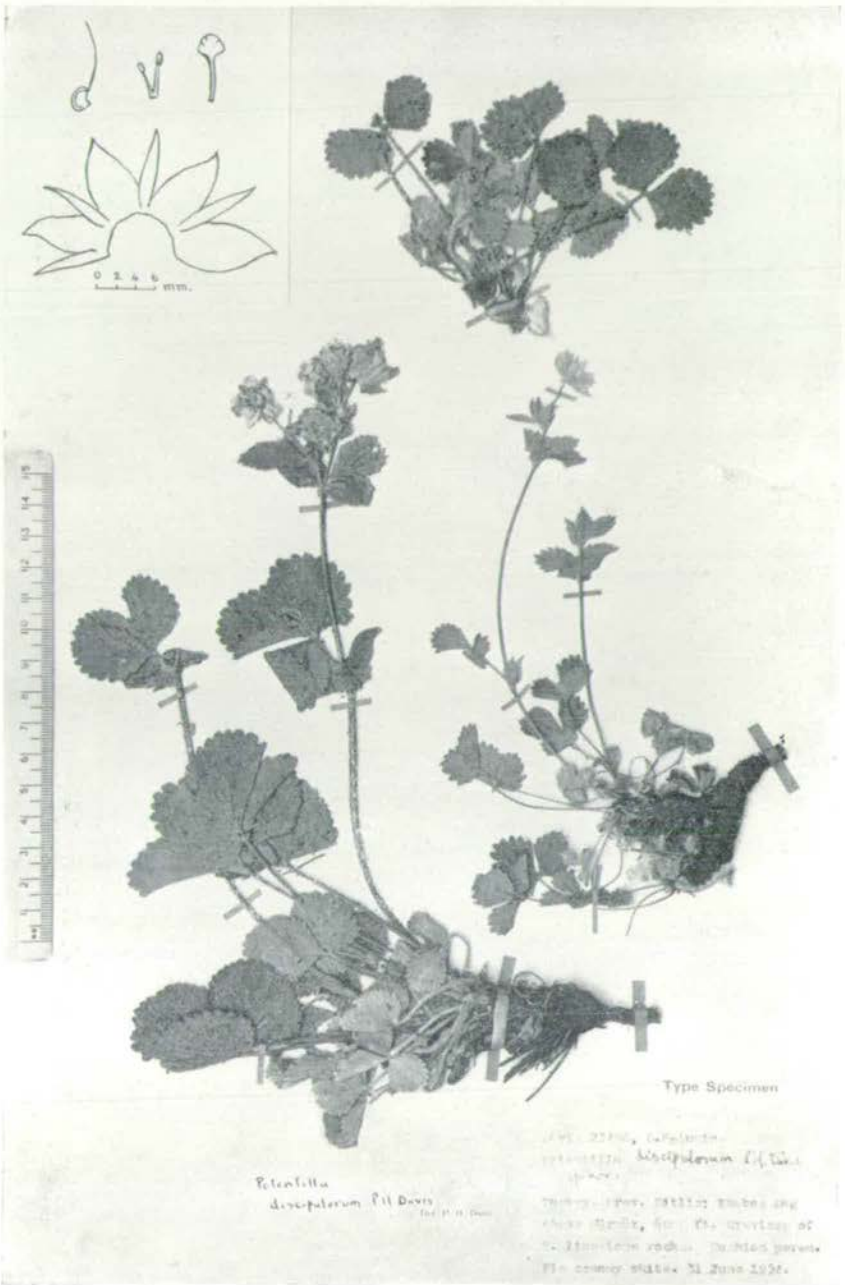


PLATE 11 *Potentilla discipulorum* P. H. Davis. (D. 23498.)

Inset : calyx (one sepal and episepal removed), petal, stamens and carpel (on twice scale of other organs).



PLATE 12 *Potentilla Doddsii* P. H. Davis. (D. 21074.)

Inset : calyx (one sepal and episepal removed), petal, stamen and carpel (on twice scale of other organs).

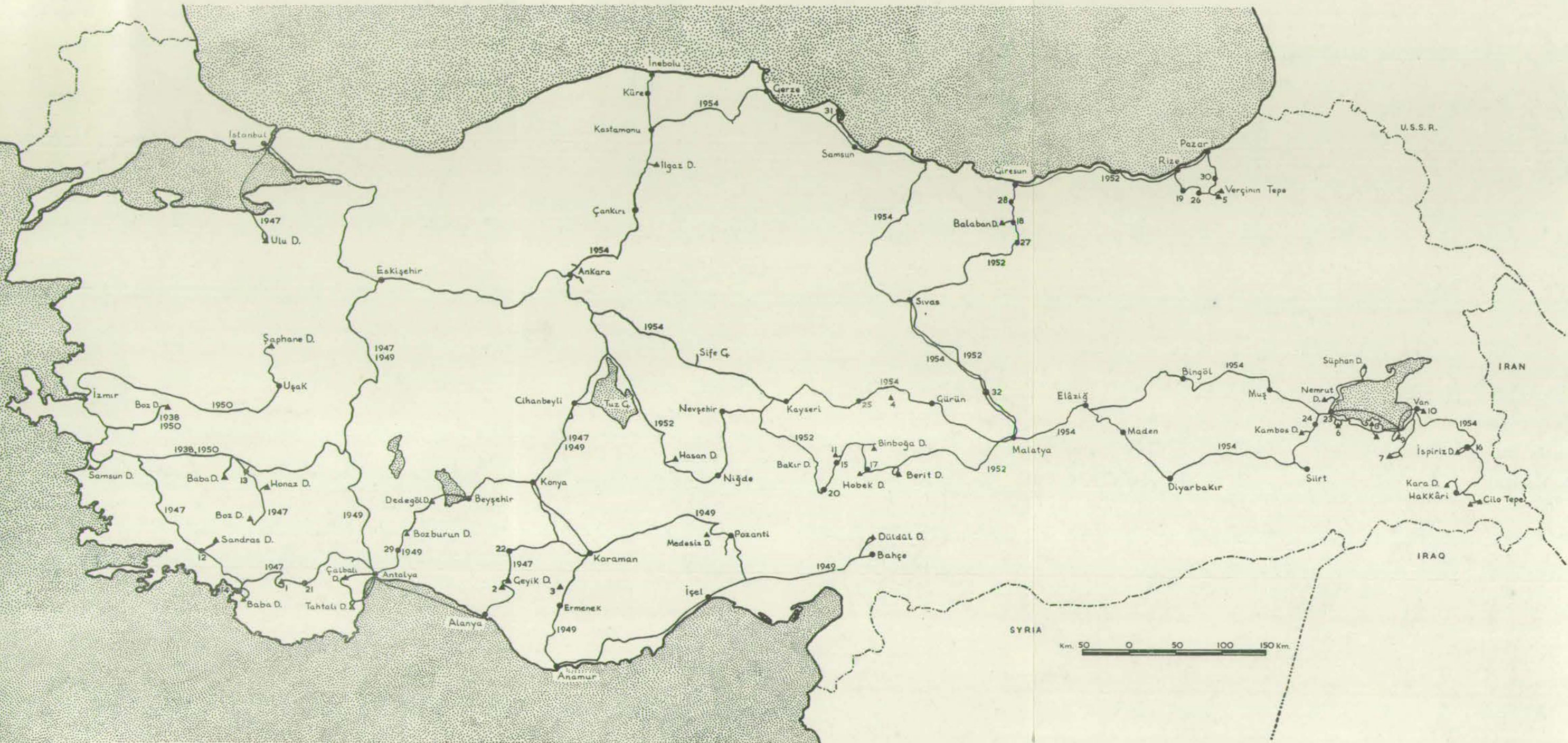
the caudex branches. It is a pleasure to name this interesting find after Mr. J. C. Dodds who accompanied me on my 1952 expedition to the Pontus and Anti-Taurus.

Potentilla libanotica Boiss., *Diagn. Ser. I* (1), 4 (1843) var. **isaurica** P. H. Davis, var. nov.

A typo petalis ellipticis acutis, carpellis solum in parte superiore carinae pilosis divergit. Antherae roseo-purpureae.

PROV. ANTALYA, dist. Alanya (Isauria): Kargi Çay, between Durbanas (above Alanya) and Derince dere, on limestone cliffs, 25 Aug. 1947, Davis & Bilger (D. 14466—holo. E; iso. K, BM).

The typical form of the species grows in Lebanon, and has outlying stations in the N. Amanus (Düldül Dağ, 1500–2000m., Haradjian 3890!) and Cilicia (*Siehe* a. 1896, n. 643!). It differs from the more western var. *isaurica* primarily in the form of its petals, which are always obovate-oblong and obtuse.



Map of Turkey showing journeys by Dr P. H. Davis. Numbered localities are named in the list on p. 2.

Düger (Aug. 2); on foot over Kara Tepe and ridge of Girdev Dağ (Eren Dağ, part of ancient Massicytus) to Girdev Gölü (Aug. 4). Climbed Girdev Dağ on Aug. 5, camping at Bel Yaylâ and making an excursion on N. side of the mountain. Descended to Yuva (Aug. 7), Kara Göl and Elmali. By bus to Antalya.

Excursion from Antalya to Yenice Kahve and Termessus (Aug. 11). By caique from Antalya to Kemer (Aug. 14). Climbed Tahtalı Dağ (ancient Solyma) via Kesme Boğaz (Aug. 14), Kuzdere and Çukur Yaylâ (where we camped), the summit being reached on Aug. 16. Returned to Kemer, thence by caique (nearly wrecked) to Antalya.

ISAURIAN TAURUS :

By caique from Antalya to Alanya (Aug. 23), whence the Taurus was crossed on horseback. From Alanya we rode through Kızıl Alan and up the Kargı Çay valley (Aug. 25-26 : Durbanas—Derince—Kozlu Dere) and through Belister, Beydan and Gönük Dere to Gözü Büyük Yaylâ between Ak Dağ and Geyik Dağ (Heldreich's Gheidagh). Climbed Ak Dağ on Aug. 28 by way of a tarn on the N. side. Passed through Han Boğaz forest to Kara Boynuz Yaylâ on W. side of Geyik Dağ, climbing the peak on Aug. 31. Descended to Eğri Göl and Söbüçimen (Sebbüçimen ?) Yaylâ at N. foot of Geyik Dağ, and rode, via Karanca Dere and Üç Pınar, to Bozkır (Sept. 2). By bus to Konya.

LYCAONIA ; BITHYNIA :

Excursions from Konya by car to Kayacık (Sept. 6) and Kaşınhan (Sept 7). By bus from Konya to Ankara, train to Istanbul, boat to Mudanya. Climbed Ulu Dağ (Bithynian Olympus) from Bursa (Sept. 12-14). Returned to Istanbul.

1949

Nos. 15,000—16,679. July 5—Sept. 10.

Accompanied by Dr Kâmil Bilger as co-collector until Aug. 8, and by Mr A. Attila until July 17. (An account of this expedition appeared in *J. Roy. Hort. Soc.* lxxvi, 54-63 : 1951.)

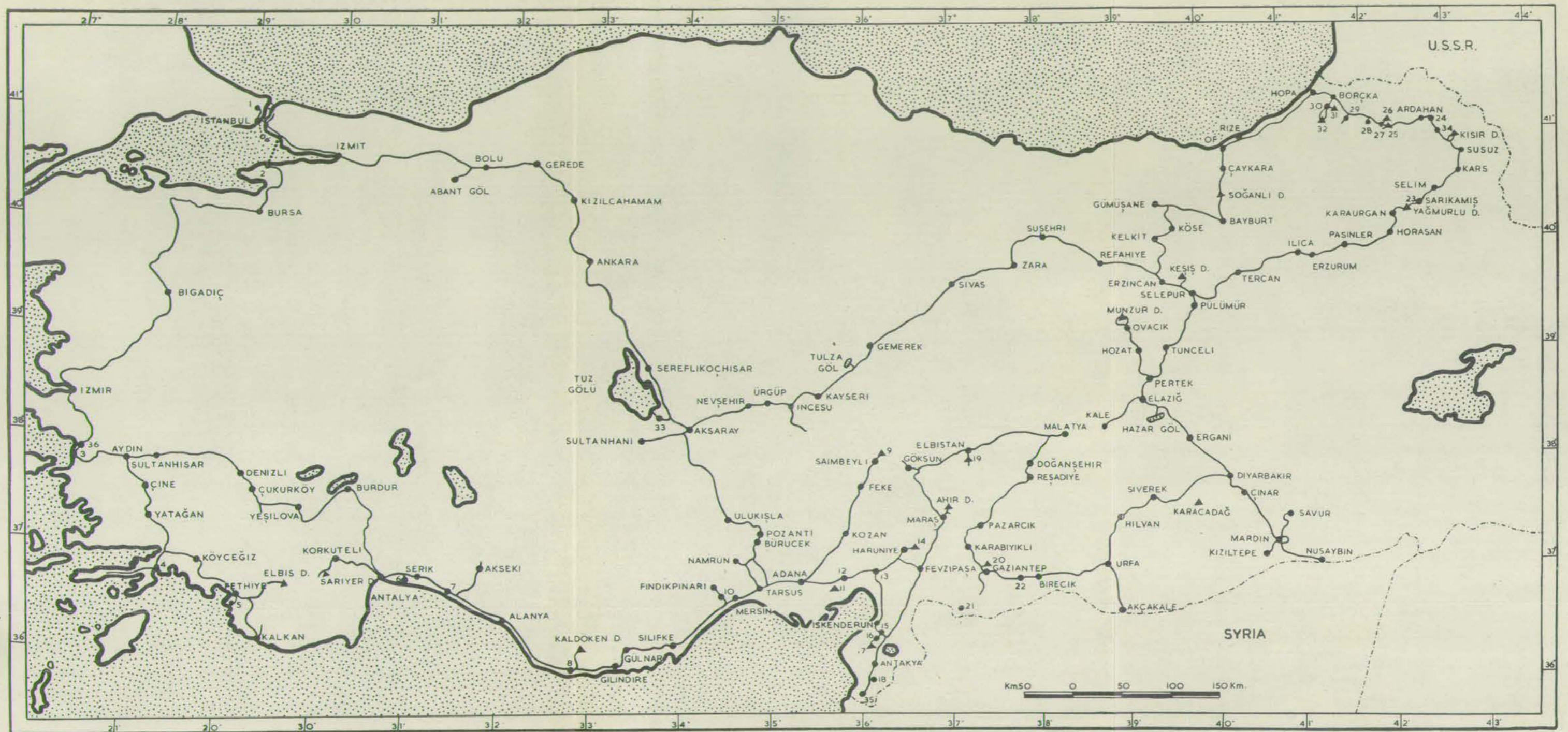
LYCIAN TAURUS :

By train from Ankara to Burdur, via Karakuyu and Dınar (July 5); bus to Antalya. By caique from Antalya to Gönük and Kemer (July 7). Climbed Tahtalı Dağ (ancient Solyma) through Kesme Boğaz; camped at Gürleyik Yaylâ and reached the summit on July 10. Rode to Ovacık on Teke Dağ (Tekeova Dağ), and through Söğüt Cuması Yaylâ to Tepe Delen Yaylâ whence Çalbalı Dağ (Pestalozza's Bereket Dagh) was climbed on July 14; descended to Fesliken Yaylâ, Kar Çukuru Yaylâ and Çukur Ardıç Yaylâ—all on the eastern flanks of Çalbalı Dağ. Thence through Söğüt Yaylâ (near Sivri Dağ) and Çakırlar to Antalya (July 16). Excursion from Antalya to Termessus (July 19).

PISIDIA :

By road from Antalya, via the mouth of the Ak Su, to Gebiz (July 22), where horses were obtained to traverse the unbotanised country between there and Lake Beyşehir—a difficult journey. From Gebiz we ascended the Sinni (Nenni) Çay to Pınargözü Yaylâ (July 23), then rode on to Boğaz

From Notes Roy. Bot. Gard. Edinburgh, xxii (1953).



TURKISH ITINERARIES IN 1956 AND 1957
 Numbered localities are named in the list on page 586.

From Notes Roy. Bot. Gard. Edinburgh, xxii (1957).

ISATIS L.

Annual to perennial herbs, glabrous, or with simple hairs. Basal leaves attenuated into a petiole; median stem leaves sessile, often auriculate. Inflorescence a corymbose panicle. Pedicels deflexed in fruit, often thickened above. Sepals non-saccate. Petals bright yellow. Stigma sessile, scarcely bilobed. Fruit indehiscent, dorso-ventrally flattened, winged (at least above), varying from orbicular to linear, loculus with a distinct midrib, 1-seeded.

An extremely difficult genus, centred in the Irano-Turanian region. The species are exceptionally variable, even in the fruit, which provides the most valuable diagnostic characters. The pattern of variation suggests that hybridisation may be widespread in the genus, but field and experimental studies are needed to substantiate this impression. Specimens should be collected with ripe fruit, and notes made on the duration of the plant. Mass gatherings are needed for a better understanding of the species limits. Boissier's sections are partly artificial and ill[^]defined, but it is difficult to see how better ones could be recognised. They are interpolated in the enumeration and modified to make them more natural. The following treatment can only be considered as very provisional. Much material without ripe fruits cannot be determined with certainty, and intermediate specimens are rather frequent, even between some taxa that are morphologically strongly differentiated.

Black Sea coast near the Bosphorus. A2(B) Istanbul:
Terkos G., 50-60 m., D. 34560 !

Endemic, closely allied to both I. tinctoria and I. glauca, neither of which occurs on sand dunes. The fruits approach those of I. litoralis Stev. from the Crimean coast, a member of the I. tinctoria complex.

14. I. tinctoria L., Sp. Pl., 670 (1753). - Syn.: I. canescens DC., Fl. Fr., 598 (1815) !

Biennial or shortly perennial. Stem 40-90 cm., glabrous or hirsute, subterete, laxly peniculate with branches coming off at more than 40° . Leaves hirsute, pubescent or glabrous, thin; basal leaves entire or weakly dentate; median stem leaves oblong or oblong-lanceolate with vertical triangular-lanceolate auricles. Flowers 3-4 mm., sepals glabrous. Fruits 10-20 x 2-5 mm., tapering from near apex to base, or oblong, glabrous or puberulent, wing thick, as wide or narrower than the median loculus (rarely wider), midrib slender.

A very polymorphic species of uncertain limits; the following subspecies may be provisionally recognised in Turkey:

1. Fruit 15-20 x 4-5 mm., gradually tapering from near apex to base, apex rounded or emarginate, glabrous, or with

S. Anatolia. C2 Antalya: Elmali Da., 1250-1600 m.,
Ehrendorfer 62-1/52-45 (perennial) ! C3 Isparta: d. Sütcüler,
 Sarp Da., 1300 m., D.15836 ! C5 Seyhan: Sis (Kozan) to Hacin
 (Saimbeyli), Post 879 ! C6 Maraş: Berit Da., 7.viii.1865,
Hauskn. !

Greece. A gathering from the Anti-Taurus (Binboga Da.,
 on N.E. side of Isik Da., 1900 m., D. 20043) differs from
 typical subsp. corymbosa in having narrowly elliptical fruits
 (c. 12 x 2-3 mm.) that are attenuated at both ends.

15. I. spectabilis Davis in Notes Roy. Bot. Gard. Edinb., 26:
 (1964).

Large biennial. Stem at least 1 m., branching below the
 middle into a wide pyramidal compound panicle. Leaves thin;
 basal leaves lanceolate-oblong, repandate-dentate, pubescent or
 glabrous; median stem leaves oblong-lanceolate, obtusely
 auricled, glabrescent. Flowers 4-5 mm., sepals glabrous.
 Fruits narrowly cuneate-oblong, 20-24 x 3.6-4.5 mm., attenuated
 below the supramedian locus, wing thick, as wide as locus,
 apex emarginate, midrib slender, fruit glabrous, bent upwards
 at the locus when ripe. - Fl. 6. - Igneous slopes, river
 banks and edges of fields, 1300-1600 m.

Type: Turkey, B7, Tunceli: Pülümür, 1600 m., igneous slopes, broad pyramidal inflorescence, 11.vii.1957, Davis & Hedge (D.30924) (holo. E!).

Upper Euphrates. B7 Tunceli: Tunceli to Pülümür, 30 miles from Tunceli, 1300 m., D. 29245 !

Endemic, Ir.-Tur. element. A very spectacular plant, related to I. tinctoria and forming yellow pyramids on the hillsides.

16. I. constricta Davis in Notes Roy. Bot. Gard. Edinb., 26: (1964).

Biennial or shortly perennant. Stem 30-50 cm., glabrous, corymbose-paniculate from below the middle. Leaves glabrous, glaucous, firm but membranous, often purplish; basal leaves obovate or oblanceolate, obscurely crenate-toothed, subentire or shortly pinnatilobed; stem leaves oblong, subobtusely aurioled. Flowers 3 mm., sepals glabrous. Fruits narrowly oblong, 14-18 x 3-4 mm., densely puberulent, somewhat constricted at the suprmedian locus, truncate-emarginate at apex, rounded at base, locus with a slender median rib and sunk between the narrow swollen wings. - Fl. 5. - Igneous slopes, 1200-1300 m.

Isatis L. : index of names and synonyms

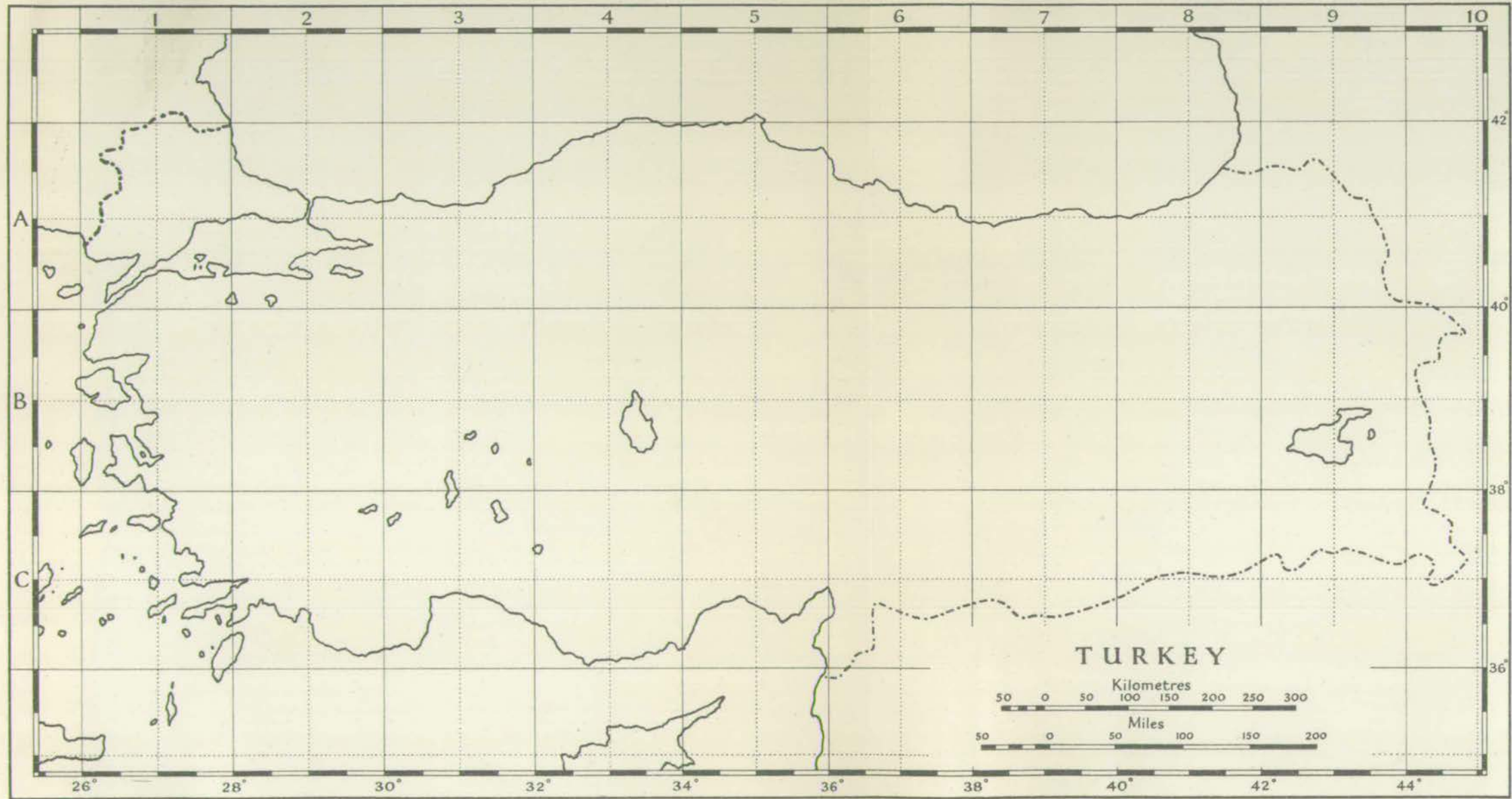
<u>aleppica</u> Scop.		= 19
var. <u>pamphylica</u> Boiss.		= 19
<u>alyssifolia</u> Boiss.		= 1c
<u>araratica</u> Rupr.		= 18
<u>arenaria</u> Azn.	13	
<u>amani</u> Davis	8	
<u>atropatana</u> Grossh.		= 1a
<u>aucheri</u> Boiss.	9	
var. <u>vellerifera</u> Boiss.		= 9
<u>besseri</u> Trautv.		under 1
<u>bitlisica</u> Davis	4	
<u>buschiana</u>	26	
<u>callifera</u> Boiss. & Bal.	22	
<u>candolleana</u> Boiss.	6	
<u>canescens</u> DC.		= 14
<u>cappadocica</u> Desv.	1	
subsp. <u>alyssifolia</u> (Boiss.) Davis	1c	
subsp. <u>cappadocica</u>	1a	
subsp. <u>macrocarpa</u> (J. & Sp.) Davis	1e	
subsp. <u>nurihakensis</u> Davis	1f	
subsp. <u>steveniana</u> (Trautv.) Davis	1b	

subsp. subradiata (Rupr.) Davis	1d	
var. gudrunensis (Boiss.) Davis	1d"	
var. subradiata	1d'	
caucasica (Rupr.) Busch		under 18
cochlearis Boiss.	24	
<u>conringifolia</u> Bornm.		= 6
constricta Davis	16	
<u>corymbosa</u> Boiss.		= 14c
<u>ericarpa</u> Blakelock		= 9
erzurumica Davis	2	
<u>exauriculata</u> Bornm.		= 11c
floribunda Boiss. ex Bornm.	20	
var. <u>rhynchocarpa</u> Bornm.		= 20
frigida Boiss. & Ky.	10	
glabrisilqua Blakelock		under 26
glaucA Aucher ex Boiss.	11	
subsp. exauriculata (Bornm.) Davis	11c	
subsp. glaucA	11a	
subsp. iconia (Boiss. & Helder.)		
Davis	11b	
var. collina Boiss.		= 11a
guestii Blakelock		under 24,26
<u>hispidA</u> Fost		= 9
huber-morathii Davis	23	

<i>grossheimii</i> Busch			under 11c
<i>iberica</i> Stev.			under 26
<i>karjagini</i> Schischk.			under 1
<i>kotschyana</i> Boiss. & Hoh.	12		
<i>kozlowskyi</i> Grossh.	18		
<i><u>lanceolata</u></i> Stapf			= 11a
<i>latisilqua</i> Stev.			under 1, 2
subsp. <i><u>subradiata</u></i> (Rupr.) Bordz.			= 1d
var. <i><u>gudrunensis</u></i> Boiss. ex Buser			= 1d
var. <i><u>haussknechtiana</u></i> Bornm.			= 1d
<i><u>latisilqua</u></i> sensu Boiss. p.p.			= 1
<i><u>leiocarpa</u></i> DC.			= 1d
<i>litoralis</i> Stev.			under 13
<i>lusitanica</i> L.	19		
<i><u>lockmanniana</u></i> Ky. & Boiss.	21		
<i>nummularia</i> Trautv.			under 1, 1e
<i>pinnatiloba</i> Davis	3		
<i><u>platycarpa</u></i> J. & Sp. var.			
<i><u>macrocarpa</u></i> J. & Sp.			= 1e
<i><u>psilocarpa</u></i> Ledeb.			= 1a
<i><u>pyramidata</u></i> Stapf			= 19
<i>sevangensis</i> Busch			under 11a, b
<i>sivasica</i> Davis	5		
<i>spatella</i> Davis	25		



<i>spectabilis</i> Davis	15	
<i>stenophylla</i> Bornm. & Gauba		under 1
<u><i>steveniana</i></u> Trautv.		= 1b
<u><i>subradiata</i></u> Rupr.		= 1d
<i>takhtajanii</i> Avet.	17	
<i>tinctoria</i> L.	14	
subsp. <i>corymbosa</i>	14c	
subsp. <i>tinctoria</i>	14a	
subsp. <i>tomentella</i>	14b	
var. <u><i>vulgaris</i></u>		-14a
var. <u><i>stenocarpa</i></u> Boiss.		= 14b
<u><i>tomentella</i></u> Boiss.		-14b
<i>undulata</i> Aucher ex Boiss.	7	
<u><i>velutina</i></u> Boiss.		= 6
<u><i>velutina</i></u> sensu Boiss., Fl. Or.		= 1a
Sect. <i>Apterolobus</i> Boiss.		
Sect. <i>Glastum</i> Boiss.		
Sect. <i>Samerarioides</i> Boiss.		
<i>Sameraria armena</i> (L.) Desv.		under 1
<u><i>Sameraria litvinovii</i></u> Busch.		= 1a



GRID MAP

